



**CONESTOGA-ROVERS  
& ASSOCIATES**

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October 11, 2010

Reference No. 056393

Mr. Michael Berkoff  
Remedial Project Manager  
U.S. Environmental Protection Agency - Region V  
Superfund Division, Remedial Response Section #2  
77 West Jackson Boulevard (SR - 6J)  
Chicago, Illinois 60604 - 3590

Dear Mr. Berkoff:

Re: Remedial Action Monthly Progress Report No. 7 - September 2010  
12<sup>th</sup> Street Landfill Operable Unit No. 4  
Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site  
Allegan and Kalamazoo County

As required by Task 4, Progress Reports in the Statement of Work for the Remedial Design and Remedial Action at the 12<sup>th</sup> Street Landfill Operable Unit No. 4, please find attached the Progress Report No. 7 for the period of September 1, 2010 through September 30, 2010.

Should you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Gregory A. Carli, P. E.

AS/cs/25

cc: J. Saric (U.S. EPA) - electronic only  
L. Kirby-Miles (U.S. EPA) - electronic only  
S. Chummar (U.S. EPA) - electronic only  
T. Prendiville (U.S. EPA) - electronic only  
S. Borries (U.S. EPA) - electronic only  
R. Frey (U.S. EPA) - electronic only  
S. Hutsell (CH2MHILL) - electronic only  
P. Bucholtz (MDNRE) - three hard copies  
K. Zakrzewski (MDNRE) - electronic only

R. Gay (Weyerhaeuser) - electronic only  
M. Lebo (Weyerhaeuser) - electronic only  
J. Jackowski (Weyerhaeuser) - electronic only  
M. Erickson (Arcadis) - electronic only  
D. Penniman (Arcadis) - electronic only  
G. Griffith (Georgia-Pacific LLC) - electronic only  
J. Keiser (CH2M Hill) - electronic only  
J. Dembowske (CRA) - electronic only  
A. Stadnyk (CRA) - electronic only

REGISTERED COMPANY FOR  
**ISO 9001**  
ENGINEERING DESIGN

**Remedial Action Progress Report No. 7**  
**September 1, 2010 to September 30, 2010**

**Remedial Design and Remedial Action**  
**12th Street Landfill, Operable Unit No. 4**  
**Otsego, Michigan**

This progress report is being submitted to the United States Environmental Protection Agency (U.S. EPA) in accordance with Task 4: Progress Reports and the Summary of Major Deliverables/Schedule contained in the Statement of Work for the Remedial Design and Remedial Action pursuant to the terms of the Consent Decree for the Design and Implementation of Certain Response Action at Operable Unit No. 4 and the Plainwell, Inc. Mill Property (Site) of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site (Consent Decree) which became effective February 22, 2005.

**1. WORK PERFORMED**

- On September 2, 2010, CRA submitted to U.S. EPA, a draft memorandum that included a status update for the leachate collection activities completed at the Site.
- On September 8, 2010, at the request of the U.S. EPA, CRA submitted an updated Master Schedule.
- On September 10, 2010, CRA submitted to U.S. EPA, a final memorandum regarding leachate collection activities completed at the Site.
- On September 10, 2010, Progress Report No. 6 was submitted to U.S. EPA. Included with the progress report were the temporary water treatment system effluent analytical results (two batches), supplemental Proctor and compaction test results, and analytical results for four soil verification samples collected from the Wyoming Asphalt Plant property (that were part of the original scope of work), five samples from the Michigan Department of Natural Resources and Environment (MDNRE) property where a wash-out occurred, and 20 verification soil samples for the additional excavation on the Wyoming Asphalt Plant property.
- On September 14, 2010, Mid America Lining Company mobilized to the Site and began installing liner on September 15, 2010. Due to inclement weather conditions, liner or geonet composite material were not installed on September 16 and 18, 2010. Due to prior commitments the Mid America Lining Company was off-Site from September 24, 2010 through October 2, 2010.
- On September 27, 2010, CRA submitted to U.S. EPA, a letter documenting a variance in construction of the landfill gas vents. The construction variance involved installing additional geocomposite material on top of the stone portion of the gas vents, fully encapsulating the stone material with geocomposite. In doing so, the fully encapsulated stone offers the liner more protection from potential damage due to direct contact with the gas vent stone.

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**Remedial Design and Remedial Action**  
**12th Street Landfill, Operable Unit No. 4**  
**Otsego, Michigan**

- The following field activities were conducted during the September 2010 reporting period:
  - Site security was reduced on September 20, 2010 from 24 hours per day, 7 days per week, to security presence only on weekends. Security patrols are conducted from 5:00pm on Friday to 7:00am on Monday.
  - Excavated leachate trenches along seeps on northwestern and southeastern slopes on September 1, 2010. Pumped and managed leachate from trenches until backfilled on September 3, 2010. Approximately 4,100 gallons of leachate was collected from the trenches.
  - Abandoned the leachate extraction wells.
  - Grading of Site based on final sub-grade elevations.
  - On-going verification surveying of landfill and surrounding areas, including surveying of liner installation.
  - Excavated anchor trench around Site.
  - Delivery and placement of sand for gas venting layer.
  - Operation of the temporary water treatment system for treatment of leachate collected from the leachate trenches.
  - Additional excavation on the Wyoming Asphalt Plant property southwest of the Site (additional excavation area) on September 8, through 10, 2010, and subsequent backfilling of excavated areas. In addition, on the Wyoming Asphalt Plant property, two test pits were excavated on the north side of the eastern-most trailer, two test pits were excavated on the south side of the western-most trailer, and one test pit was excavated near the southwest boundary of the excavation area.
  - The collection of 10 verification soil samples, including two duplicates from the additional excavation on the Wyoming Asphalt Plant property. In addition, one verification soil sample, was collected from the test pit excavated on the south side (west end) of the western-most trailer and one verification soil sample was collected from the test pit excavated near the southwest boundary of the excavation area on the Wyoming Asphalt Plant property. Analytical results for the verification soil samples collected from the Wyoming Asphalt Plant property are presented in Attachment A. Included with the results are data for volatile organic compound (VOC) analysis for previous samples collected on the Wyoming Asphalt Plant property on August 26 and 27, 2010, which were not available for the August 2010 monthly progress report.
  - Clean-up of area at northeast corner of Site where pocket of paper residuals was encountered, and placement of material under gas venting layer near southwest end of Site.
  - Installation of the remaining gas vent.

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**Remedial Design and Remedial Action**  
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- Installed liner on the eastern half of Site, along slope on north center portion of Site, and along a portion of the slope on the northwest side of Site. Twenty-two liner destruct samples were collected and submitted for laboratory testing. Results for the liner destruct samples and the liner installation quality assurance/quality control (QA/QC) data are presented in Attachment B.
- Installed liner flap for surface water management on slopes along the southeastern, east, northeastern, and north sides of Site.
- Installed geonet composite material on top of liner on eastern half of Site and along slope on north center portion of Site.
- Backfilled anchor trench along the southeast, east, and northern portions of Site.
- Delivery and placement of general fill material on geonet composite material on top portion and along upper slopes of landfill from southeast corner to northeast corner.
- Placement of general fill material on geonet composite material in swale areas along the western and northern MDNRE property boundaries.
- Decontaminating equipment including the remaining post-treatment frac tank and pre-treatment frac tank.
- Dismantled the water treatment system and decontamination stations.

**2. DATA RECEIVED**

- Twenty-two liner destruct tests were submitted for laboratory analysis during the September 2010 reporting period. Results exceeded requirements and are provided as Attachment B. In addition, liner installation QA/QC data are also presented as Attachment B.
- Analytical results for additional excavation and test pits conducted on the Wyoming Asphalt Plant property are presented as Attachment A. A total of 10 soil samples were collected from the additional excavation area and two soil samples were collected from the test pits conducted on the Wyoming Asphalt Plant property southwest of the landfill have been received during the September 2010 reporting period.

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**3. MODIFICATIONS TO WORK PLANS OR OTHER SCHEDULES PROPOSED TO, OR APPROVED BY, THE U.S. EPA**

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- CRA submitted to the U.S. EPA an updated Master Schedule on September 8, 2010.
- One variance in construction has occurred and includes covering the top stone portion of the gas vents with geocomposite. This variation in construction was submitted to the U.S. EPA on September 27, 2010. The additional geocomposite material fully encapsulates the gas venting stone, offering more protection for the liner against damage caused by direct contact with the gas vent stone material.
- Limited Site work occurred on September 16, 2010 due to inclement weather. In addition, due to inclement weather conditions, Mid America Lining Company was not able to install liner/geocomposite material on September 16 or 18, 2010.

**4. PROBLEMS ENCOUNTERED AND PLANNED RESOLUTION**

- As previously noted above, work at the Site was stopped due to inclement weather conditions for a total of one day for CRA Services and two days for Mid America Lining Company during the September 2010 reporting period. Site activities were limited to inspection and maintenance of the soil erosion and sedimentation controls and dismantling the decontamination stations.
- Mid America Lining Company attempted to work on Saturday, September 18, 2010, but inclement weather conditions prevented Site work. Mid America Lining Company was able to install geonet composite material on Sunday, September 19, 2010.
- Due to prior commitments the Mid America Lining Company was off-Site from September 24, 2010 through October 2, 2010.
- CRA Services is relatively on schedule with the revised master schedule submitted on September 8, 2010. Liner installation has been conducted six days a week, to account for the lost time to inclement weather conditions.

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Otsego, Michigan**

**5. WORK ANTICIPATED DURING THE NEXT REPORTING PERIOD**

- In accordance with the RAWP, the following field activities are scheduled to start during the October 2010 reporting period:
  - Continue installation of liner and geonet composite material.
  - Continue placement of general fill on installed geonet composite material.
  - Continue construction of swale areas.
  - Continue backfilling of anchor trench on northwest, west, and southwest sides of Site.
  - Begin placement of topsoil on northeastern portion of Site.
  - Begin seeding of areas where topsoil has been placed.

**6. ANTICIPATED DEVELOPMENT WITH WORK DURING THE NEXT PERIOD**

- Continue to hold weekly conference calls and/or meetings between U.S. EPA and Project Technical Team

**7. OTHER RELEVANT INFORMATION**

- No other Site related information to report

ATTACHMENT A  
LABORATORY ANALYTICAL RESULTS  
SEPTEMBER 2010 REPORTING PERIOD

ATTACHMENT B  
LINER MATERIAL QUALITY CONTROL LABORATORY RESULTS  
SEPTEMBER 2010 REPORTING PERIOD

PREPARED BY:



**CONESTOGA-ROVERS  
& ASSOCIATES**

4141 Davis Creek Court  
Kalamazoo, MI 49001-0838  
Telephone: (269) 344-1230 Fax: (269) 344-8558  
[www.CRAworld.com](http://www.CRAworld.com)

## SUBMITTAL

DATE: September 20, 2010

SUBMITTAL NO.: 56913-36

PROJECT NO.: 56913

PROJECT NAME: 12<sup>th</sup> Street Landfill

### CONSTRUCTION

MANAGER: Jodie Dembowske

ENGINEER: Mr. Greg Carli

Conestoga-Rovers & Associates

Conestoga-Rovers & Associates

4141 Davis Creek Court

261 Martindale Rd., Unit #3

Kalamazoo, MI 49001

St. Catherines, ON L2W 1A2

SUPPLIER: Mid-America Lining

SUBCONTRACTOR: TRI/ Environmental Inc.

9063 Bee Cave Road

Austin, TX 78733

MANUFACTURER: Agra America

| QTY | SPEC. NO. & TITLE       | DWG. NO. | DESCRIPTION / LOCATION INSTALLED               |
|-----|-------------------------|----------|--|
| 1   | 02072 LLDPE Geomembrane |          | Textured 40 mil Liner - Testing Peel and Shear |
|     |                         |          |  |

### CONSTRUCTION MANAGER'S / ENGINEER'S REVIEW AND APPROVAL:

COPY TO: File 056913

COMPLETED BY: Jodie Dembowske  
[Please Print]

SIGNED: A handwritten signature in blue ink that reads "Jodie Dembowske".



---

Date: 2010-09-18

**Mail To:**  
**Jodie Dembowske**  
**CRA Eng.**  
**4141 Davis Creek Court**  
**Kalamazoo , MI , 49001**

**Bill To:**  
**CRA Eng.**  
**56913**

e-mail:jdembowske@craworld.com

Dear Ms. Dembowske,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

**Project:** **12TH STREET LANDFILL**

TRI Job Reference Number: **4036**

Material(s) Tested: **(8) Heat Fusion Weld Seam(s)**

Test(s) Requested: **SAME DAY Peel and Shear**  
**(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**Codes:**

|         |   |
|---------|---|
| AD      | Adhesion Failure (100% Peel)                                    |
| BRK     | Break in sheeting away from Seam edge.                          |
| SE      | Break in sheeting at edge of seam.                              |
| AD-BRK  | Break in sheeting after some adhesion failure - partial peel.   |
| SIP     | Separation in the plane of the sheet (leaving the bond intact). |
| FTB     | Film tearing bond (all non "AD" failures).                      |
| NON-FTB | 100% peel.  |

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

A handwritten signature in black ink that reads "Melissa Hunter". The signature is fluid and cursive, with "Melissa" on the top line and "Hunter" on the bottom line.

Melissa Hunter  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstesting.com>



**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**  
**TRI Client: CRA Eng.**  
**Project: 12TH STREET LANDFILL**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4036**

| PARAMETER                                  | TEST REPLICATE NUMBER |     |     |     |     | MEAN          |
|--|-----------------------|-----|-----|-----|-----|---------------|
|  | 1                     | 2   | 3   | 4   | 5   |               |
| <b>Sample ID: DS-1   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                             |                       |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                        | 82                    | 89  | 86  | 83  | 79  | <b>84</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                             |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                        | 83                    | 78  | 84  | 82  | 87  | <b>82</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                               |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                       | 107                   | 112 | 108 | 113 | 110 | <b>110</b>    |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 |               |
| <b>Sample ID: DS-2   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                             |                       |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                        | 92                    | 94  | 89  | 92  | 91  | <b>91</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                             |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                        | 83                    | 80  | 85  | 81  | 85  | <b>83</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                               |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                       | 109                   | 115 | 111 | 109 | 111 | <b>111</b>    |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 |               |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**  
**TRI Client: CRA Eng.**  
**Project: 12TH STREET LANDFILL**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4036**

| PARAMETER                                  | TEST REPLICATE NUMBER |     |     |     |     | MEAN          |
|--|-----------------------|-----|-----|-----|-----|---------------|
|  | 1                     | 2   | 3   | 4   | 5   |               |
| <b>Sample ID: DS-3   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                             |                       |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                        | 84                    | 84  | 87  | 83  | 82  | <b>84</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                             |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                        | 86                    | 89  | 88  | 85  | 89  | <b>87</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                               |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                       | 110                   | 111 | 109 | 108 | 109 | <b>109</b>    |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 |               |
| <b>Sample ID: DS-4   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                             |                       |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                        | 84                    | 83  | 76  | 88  | 90  | <b>84</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                             |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                        | 75                    | 86  | 81  | 77  | 88  | <b>81</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                               |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                       | 105                   | 106 | 106 | 108 | 107 | <b>106</b>    |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 |               |

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**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: CRA Eng.**  
**Project: 12TH STREET LANDFILL**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4036**

| PARAMETER                                  | TEST REPLICATE NUMBER |     |     |     |     |               |
|--|-----------------------|-----|-----|-----|-----|---------------|
|  | 1                     | 2   | 3   | 4   | 5   | MEAN          |
| <b>Sample ID: DS-5   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                             |                       |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                        | 83                    | 83  | 83  | 84  | 81  | <b>83</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                             |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                        | 82                    | 91  | 83  | 87  | 86  | <b>86</b>     |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                               |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                       | 107                   | 110 | 109 | 110 | 115 | <b>110</b>    |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 |               |

|  |     |     |     |     |     |               |
|--|-----|-----|-----|-----|-----|---------------|
| <b>Sample ID: DS-6   Weld: Heat Fusion</b> |     |     |     |     |     |               |
| <b>Side: A</b>                             |     |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                        | 87  | 88  | 84  | 84  | 86  | <b>86</b>     |
| Peel Incursion (%)                         | <5  | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE  | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                             |     |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                        | 89  | 90  | 87  | 92  | 88  | <b>89</b>     |
| Peel Incursion (%)                         | <5  | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                 | SE  | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                      | FTB | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                               |     |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                       | 88  | 93  | 89  | 92  | 94  | <b>91</b>     |
| Shear Elongation @ Break (%)               | >50 | >50 | >50 | >50 | >50 |               |

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**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**  
**TRI Client: CRA Eng.**  
**Project: 12TH STREET LANDFILL**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4036**

| PARAMETER                                  | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|--|-----------------------|-----|-----|-----|-----|------|--|
|  | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-7   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                             |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                        | 91                    | 93  | 101 | 94  | 86  | 93   |  |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                             |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                        | 87                    | 96  | 80  | 91  | 92  | 89   |  |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                               |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                       | 111                   | 110 | 112 | 108 | 110 | 110  |  |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 | >50  |  |

|  |     |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|-----|
| <b>Sample ID: DS-8   Weld: Heat Fusion</b> |     |     |     |     |     |     |
| <b>Side: A</b>                             |     |     |     |     |     |     |
| Peel Strength (ppi)                        | 89  | 90  | 82  | 84  | 85  | 86  |
| Peel Incursion (%)                         | <5  | <5  | <5  | <5  | <5  | <5  |
| Peel Locus Of Failure Code                 | SE  | SE  | SE  | SE  | SE  |     |
| Peel NSF Failure Code                      | FTB | FTB | FTB | FTB | FTB |     |
| <b>Side: B</b>                             |     |     |     |     |     |     |
| Peel Strength (ppi)                        | 91  | 95  | 90  | 95  | 93  | 93  |
| Peel Incursion (%)                         | <5  | <5  | <5  | <5  | <5  | <5  |
| Peel Locus Of Failure Code                 | SE  | SE  | SE  | SE  | SE  |     |
| Peel NSF Failure Code                      | FTB | FTB | FTB | FTB | FTB |     |
| <b>Shear</b>                               |     |     |     |     |     |     |
| Shear Strength (ppi)                       | 101 | 106 | 109 | 110 | 106 | 106 |
| Shear Elongation @ Break (%)               | >50 | >50 | >50 | >50 | >50 | >50 |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

PREPARED BY:



**CONESTOGA-ROVERS  
& ASSOCIATES**

4141 Davis Creek Court  
Kalamazoo, MI 49001-0838  
Telephone: (269) 344-1230  
www.CRAworld.com

Fax: (269) 344-8558

## SUBMITTAL

DATE: September 21, 2010

SUBMITTAL NO.: 56913-37

PROJECT NO.: 56913

PROJECT NAME: 12<sup>th</sup> Street Landfill

### CONSTRUCTION

MANAGER: Jodie Dembowske

ENGINEER: Mr. Greg Carli

Conestoga-Rovers & Associates

Conestoga-Rovers & Associates

4141 Davis Creek Court

261 Martindale Rd., Unit #3

Kalamazoo, MI 49001

St. Catherines, ON L2W 1A2

SUPPLIER: Mid-America Lining

SUBCONTRACTOR: TRI/ Environmental Inc.

9063 Bee Cave Road

Austin, TX 78733

MANUFACTURER: Agru America

| QTY | SPEC. NO. & TITLE       | DWG. NO. | DESCRIPTION / LOCATION INSTALLED                                       |
|-----|-------------------------|----------|--|
| 1   | 02072 LLDPE Geomembrane |          | Textured 40 mil Liner - Testing Peel and Shear - 2 <sup>nd</sup> Batch |
|     |                         |          |  |

### CONSTRUCTION MANAGER'S / ENGINEER'S REVIEW AND APPROVAL:

COPY TO: File 056913

COMPLETED BY: Jodie Dembowske  
[Please Print]

SIGNED:



TRI/Environmental, Inc.  
A Texas Research International Company

Date: 2010-09-21

Mail To:  
**Jodie Dembowske**  
**Conestoga Rovers and Associates**  
**4141 DAVIS Creek Road**  
**Kalamazoo , MI , 49001**

e-mail:jdembowske@craworld.com

Bill To:  
**Conestoga Rovers and Associates**  
**Project # : 56913**

Dear Dembowske,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project: **12th Street Landfill**

TRI Job Reference Number: **4052**

Material(s) Tested: (5) Heat Fusion Weld Seam(s)  
(2) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear  
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

| Codes:  |   |
|---------|---|
| AD      | Adhesion Failure (100% Peel)                                    |
| BRK     | Break in sheeting away from Seam edge.                          |
| SE      | Break in sheeting at edge of seam.                              |
| AD-BRK  | Break in sheeting after some adhesion failure - partial peel.   |
| SIP     | Separation in the plane of the sheet (leaving the bond intact). |
| FTB     | Film tearing bond (all non "AD" failures).                      |
| NON-FTB | 100% peel.  |

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstestinginc.com>



TRI/Environmental, Inc.  
A Texas Research International Company

### DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Conestoga Rovers and Associates  
Project: 12th Street Landfill

Material: 40mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 4052

| PARAMETER                                  | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|--|-----------------------|-----|-----|-----|-----|------|--|
|  | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-9   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                             |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                        | 90                    | 91  | 90  | 89  | 88  | 90   |  |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                             |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                        | 90                    | 90  | 78  | 92  | 88  | 88   |  |
| Peel Incursion (%)                         | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                 | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                      | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                               |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                       | 110                   | 111 | 111 | 115 | 110 | 111  |  |
| Shear Elongation @ Break (%)               | >50                   | >50 | >50 | >50 | >50 | >50  |  |

|   |     |     |     |     |     |     |
|---|-----|-----|-----|-----|-----|-----|
| <b>Sample ID: DS-10   Weld: Heat Fusion</b> |     |     |     |     |     |     |
| <b>Side: A</b>                              |     |     |     |     |     |     |
| Peel Strength (ppi)                         | 105 | 94  | 98  | 88  | 92  | 95  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  | <5  |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  | SE  |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB | FTB |
| <b>Side: B</b>                              |     |     |     |     |     |     |
| Peel Strength (ppi)                         | 86  | 104 | 85  | 101 | 89  | 93  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  | <5  |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  | SE  |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB | FTB |
| <b>Shear</b>                                |     |     |     |     |     |     |
| Shear Strength (ppi)                        | 111 | 110 | 114 | 113 | 115 | 113 |
| Shear Elongation @ Break (%)                | >50 | >50 | >50 | >50 | >50 | >50 |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates  
Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4052**

**TEST REPLICATE NUMBER**

| PARAMETER                                   | 1   | 2   | 3   | 4   | 5   | MEAN       |
|---|-----|-----|-----|-----|-----|------------|
| <b>Sample ID: DS-11   Weld: Heat Fusion</b> |     |     |     |     |     |            |
| <b>Side: A</b>                              |     |     |     |     |     |            |
| Peel Strength (ppi)                         | 91  | 83  | 83  | 83  | 89  | <b>86</b>  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  |            |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  |            |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB |            |
| <b>Side: B</b>                              |     |     |     |     |     |            |
| Peel Strength (ppi)                         | 97  | 88  | 96  | 93  | 93  | <b>93</b>  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  |            |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  |            |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB |            |
| <b>Shear</b>                                |     |     |     |     |     |            |
| Shear Strength (ppi)                        | 115 | 114 | 120 | 120 | 119 | <b>118</b> |
| Shear Elongation @ Break (%)                | >50 | >50 | >50 | >50 | >50 |            |
| <b>Sample ID: DS-12   Weld: Heat Fusion</b> |     |     |     |     |     |            |
| <b>Side: A</b>                              |     |     |     |     |     |            |
| Peel Strength (ppi)                         | 91  | 91  | 90  | 95  | 95  | <b>92</b>  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  |            |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  |            |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB |            |
| <b>Side: B</b>                              |     |     |     |     |     |            |
| Peel Strength (ppi)                         | 81  | 83  | 85  | 88  | 86  | <b>84</b>  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  |            |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  |            |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB |            |
| <b>Shear</b>                                |     |     |     |     |     |            |
| Shear Strength (ppi)                        | 109 | 107 | 111 | 110 | 113 | <b>110</b> |
| Shear Elongation @ Break (%)                | >50 | >50 | >50 | >50 | >50 |            |

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TRI/Environmental, Inc.  
A Texas Research International Company

### DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Conestoga Rovers and Associates

Project: 12th Street Landfill

Material: 40mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 4052

#### TEST REPLICATE NUMBER

| PARAMETER                                   | 1   | 2   | 3   | 4   | 5   | MEAN       |
|---|-----|-----|-----|-----|-----|------------|
| <b>Sample ID: DS-13   Weld: Heat Fusion</b> |     |     |     |     |     |            |
| <b>Side: A</b>                              |     |     |     |     |     |            |
| Peel Strength (ppi)                         | 96  | 98  | 94  | 98  | 99  | <b>97</b>  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  |            |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  |            |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB |            |
| <b>Side: B</b>                              |     |     |     |     |     |            |
| Peel Strength (ppi)                         | 94  | 93  | 92  | 91  | 99  | <b>94</b>  |
| Peel Incursion (%)                          | <5  | <5  | <5  | <5  | <5  |            |
| Peel Locus Of Failure Code                  | SE  | SE  | SE  | SE  | SE  |            |
| Peel NSF Failure Code                       | FTB | FTB | FTB | FTB | FTB |            |
| <b>Shear</b>                                |     |     |     |     |     |            |
| Shear Strength (ppi)                        | 106 | 104 | 106 | 110 | 108 | <b>107</b> |
| Shear Elongation @ Break (%)                | >50 | >50 | >50 | >50 | >50 |            |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK**  
**TRI Client: Conestoga Rovers and Associates**  
**Project: 12th Street Landfill**

**Material: 40 mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4052**

| PARAMETER  | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|--|-----------------------|-----|-----|-----|-----|------|--|
|  | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-14   Weld: Single Extrusion</b> |                       |     |     |     |     |      |  |
| <b>Side: Peel</b>                                |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                              | 88                    | 92  | 87  | 88  | 88  | 88   |  |
| Peel Incursion (%)                               | <5%                   | <5% | <5% | <5% | <5% |      |  |
| Peel Locus Of Failure Code                       | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                            | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                     |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                             | 86                    | 87  | 89  | 86  | 86  | 87   |  |
| Shear Elongation @ Break (%)                     | >50                   | >50 | >50 | >50 | >50 |      |  |
| <b>Sample ID: DS-15   Weld: Single Extrusion</b> |                       |     |     |     |     |      |  |
| <b>Side: Peel</b>                                |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                              | 87                    | 81  | 88  | 72  | 88  | 83   |  |
| Peel Incursion (%)                               | <5%                   | <5% | <5% | <5% | <5% |      |  |
| Peel Locus Of Failure Code                       | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                            | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                     |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                             | 86                    | 86  | 85  | 88  | 89  | 87   |  |
| Shear Elongation @ Break (%)                     | >50                   | >50 | >50 | >50 | >50 |      |  |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

**PREPARED BY:**



# **CONESTOGA-ROVERS & ASSOCIATES**

4141 Davis Creek Court  
Kalamazoo, MI 49001-0838  
Telephone: (269) 344-1230      Fax: (269) 344-8558  
[www.CRAworld.com](http://www.CRAworld.com)

**SUBMITTAL**

**DATE:** September 22, 2010

SUBMITTAL No.: 56913-38

PROJECT NO.: 56913

**PROJECT NAME:** 12<sup>th</sup> Street Landfill

## CONSTRUCTION

**MANAGER:** Jodie Dembowske  
Conestoga-Rovers & Associates  
4141 Davis Creek Court  
Kalamazoo, MI 49001

**ENGINEER:** Mr. Greg Carli  
Conestoga-Rovers & Associates  
261 Martindale Rd., Unit #3  
St. Catherines, ON L2W 1A2

**SUPPLIER:** Mid-America Lining

**SUBCONTRACTOR:** TRI/ Environmental Inc.  
9063 Bee Cave Road  
Austin, TX 78733

**MANUFACTURER:** Agru America

| QTY | SPEC. NO. & TITLE       | DWG. NO. | DESCRIPTION / LOCATION INSTALLED                                       |
|-----|-------------------------|----------|--|
| 1   | 02072 LLDPE Geomembrane |          | Textured 40 mil Liner - Testing Peel and Shear – 3 <sup>rd</sup> Batch |
|     |                         |          |  |

## **CONSTRUCTION MANAGER'S / ENGINEER'S REVIEW AND APPROVAL:**

COPY TO: File 056913

SIGNED: Judie Donahue



---

Date: 2010-09-22

**Mail To:**

**Jodie Dembowske  
Conestoga Rovers and Associates  
4141 DAVIS Creek Road  
Kalamazoo , MI , 49001**

e-mail:jdembowske@craworld.com

**Bill To:**

**Conestoga Rovers and Associates  
Project # : 56913**

Dear Dembowske,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

**Project:** **12th Street Landfill**

TRI Job Reference Number: **4080**

Material(s) Tested: (3) Heat Fusion Weld Seam(s)  
(1) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear  
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

**Codes:**

|         |   |
|---------|---|
| AD      | Adhesion Failure (100% Peel)                                    |
| BRK     | Break in sheeting away from Seam edge.                          |
| SE      | Break in sheeting at edge of seam.                              |
| AD-BRK  | Break in sheeting after some adhesion failure - partial peel.   |
| SIP     | Separation in the plane of the sheet (leaving the bond intact). |
| FTB     | Film tearing bond (all non "AD" failures).                      |
| NON-FTB | 100% peel.  |

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

A handwritten signature in black ink that reads "Jennifer T. Tenney".

Jennifer Tenney  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstestinginc.com>



**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4080**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-16   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 80                    | 82  | 79  | 79  | 86  | 81   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 84                    | 80  | 81  | 83  | 81  | 82   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 111                   | 112 | 109 | 106 | 109 | 110  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |
| <b>Sample ID: DS-17   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 90                    | 88  | 83  | 91  | 85  | 87   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 89                    | 88  | 82  | 90  | 87  | 87   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 109                   | 105 | 107 | 110 | 109 | 108  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4080**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-18   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 94                    | 81  | 93  | 86  | 89  | 89   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 83                    | 90  | 94  | 88  | 90  | 89   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 109                   | 107 | 109 | 110 | 112 | 109  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |      |  |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK**  
**TRI Client: Conestoga Rovers and Associates**  
**Project: 12th Street Landfill**

**Material: 40 mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4080**

| PARAMETER  | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|--|-----------------------|-----|-----|-----|-----|------|--|
|  | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-19   Weld: Single Extrusion</b> |                       |     |     |     |     |      |  |
| <b>Side: Peel</b>                                |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                              | 87                    | 92  | 90  | 88  | 90  | 89   |  |
| Peel Incursion (%)                               | <5%                   | <5% | <5% | <5% | <5% |      |  |
| Peel Locus Of Failure Code                       | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                            | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                     |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                             | 89                    | 87  | 87  | 92  | 89  | 89   |  |
| Shear Elongation @ Break (%)                     | >50                   | >50 | >50 | >50 | >50 |      |  |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

PREPARED BY:



**CONESTOGA-ROVERS**  
& ASSOCIATES

4141 Davis Creek Court  
Kalamazoo, MI 49001-0838  
Telephone: (269) 344-1230      Fax: (269) 344-8558  
[www.CRAworld.com](http://www.CRAworld.com)

## SUBMITTAL

DATE: September 28, 2010

SUBMITTAL NO.: 56913-40

PROJECT NO.: 56913

PROJECT NAME: 12th Street Landfill

**CONSTRUCTION**

MANAGER: Jodie Dembowske  
Conestoga-Rovers & Associates  
4141 Davis Creek Court  
Kalamazoo, MI 49001

ENGINEER: Mr. Greg Carli  
Conestoga-Rovers & Associates  
261 Martindale Rd., Unit #3  
St. Catherines, ON L2W 1A2

SUPPLIER: Mid-America Lining  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SUBCONTRACTOR: TRI/ Environmental Inc.  
9063 Bee Cave Road  
Austin, TX 78733  
\_\_\_\_\_

MANUFACTURER: Agra America

| QTY | SPEC. NO. & TITLE       | DWG. NO. | DESCRIPTION / LOCATION INSTALLED                                       |
|-----|-------------------------|----------|--|
| 1   | 02072 LLDPE Geomembrane |          | Textured 40 mil Liner - Testing Peel and Shear - 3 <sup>rd</sup> Batch |
|     |                         |          |  |

**CONSTRUCTION MANAGER'S / ENGINEER'S REVIEW AND APPROVAL:**

COPY TO: File 056913

SIGNED:

COMPLETED BY: Jodie Dembowske  
[Please Print]

A handwritten signature in black ink that reads "Jodie Dembowske". It is written in a cursive style with some variations in letter height and thickness.



TRI/Environmental, Inc.  
A Texas Research International Company

Date: 2010-09-27

**Mail To:**

**Jodie Dembowske  
Conestoga Rovers and Associates  
4141 Davis Creek Road  
Kalamazoo , MI , 49001**

e-mail:jdembowske@craworld.com

**Bill To:**

**Conestoga Rovers and Associates  
Project # : 56913**

Dear Dembowske,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

**Project:** **12th Street Landfill**

**TRI Job Reference Number:** **4132**

**Material(s) Tested:** **(3) Heat Fusion Weld Seam(s)**

**Test(s) Requested:** **SAME DAY Peel and Shear  
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**Codes:**

|         |   |
|---------|---|
| AD      | Adhesion Failure (100% Peel)                                    |
| BRK     | Break in sheeting away from Seam edge.                          |
| SE      | Break in sheeting at edge of seam.                              |
| AD-BRK  | Break in sheeting after some adhesion failure - partial peel.   |
| SIP     | Separation in the plane of the sheet (leaving the bond intact). |
| FTB     | Film tearing bond (all non "AD" failures).                      |
| NON-FTB | 100% peel.  |

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

A handwritten signature in black ink that reads "Jennifer T. Tenney".

Jennifer Tenney  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstestinginc.com>



**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log #: 4132**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     |               |
|---|-----------------------|-----|-----|-----|-----|---------------|
|   | 1                     | 2   | 3   | 4   | 5   |               |
| <b>Sample ID: DS-20   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                              |                       |     |     |     |     |               |
| Peel Strength (ppi)                         | 84                    | 78  | 80  | 96  | 91  | <b>86</b>     |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                              |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                         | 91                    | 90  | 88  | 96  | 87  | <b>90</b>     |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                                |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                        | 105                   | 106 | 112 | 115 | 108 | <b>109</b>    |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |               |
| <b>Sample ID: DS-21   Weld: Heat Fusion</b> |                       |     |     |     |     |               |
| <b>Side: A</b>                              |                       |     |     |     |     | <b>Peel A</b> |
| Peel Strength (ppi)                         | 83                    | 89  | 85  | 87  | 92  | <b>87</b>     |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Side: B</b>                              |                       |     |     |     |     | <b>Peel B</b> |
| Peel Strength (ppi)                         | 97                    | 93  | 112 | 102 | 86  | <b>98</b>     |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |               |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |               |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |               |
| <b>Shear</b>                                |                       |     |     |     |     | <b>Shear</b>  |
| Shear Strength (ppi)                        | 102                   | 105 | 108 | 110 | 104 | <b>106</b>    |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |               |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4132**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |           |
|---|-----------------------|-----|-----|-----|-----------|
|   | 1                     | 2   | 3   | 4   | 5         |
| <b>Sample ID: DS-22   Weld: Heat Fusion</b> |                       |     |     |     |           |
| <b>Side: A</b>                              |                       |     |     |     |           |
| Peel Strength (ppi)                         | 87                    | 72  | 81  | 90  | 94        |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5        |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE        |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB       |
| <b>Side: B</b>                              |                       |     |     |     |           |
| Peel Strength (ppi)                         | 88                    | 87  | 84  | 92  | 89        |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5        |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE        |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB       |
| <b>Shear</b>                                |                       |     |     |     |           |
| Shear Strength (ppi)                        | 97                    | 98  | 99  | 100 | 96        |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50       |
|   |                       |     |     |     | <b>85</b> |
|   |                       |     |     |     | <b>88</b> |
|   |                       |     |     |     | <b>98</b> |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

PREPARED BY:



**CONESTOGA-ROVERS  
& ASSOCIATES**

4141 Davis Creek Court  
Kalamazoo, MI 49001-0838  
Telephone: (269) 344-1230      Fax: (269) 344-8558  
[www.CRAworld.com](http://www.CRAworld.com)

## SUBMITTAL

DATE: October 6, 2010

SUBMITTAL No.: 56913-48

PROJECT No.: 56913

PROJECT NAME: 12th Street Landfill

### CONSTRUCTION

MANAGER: Jodie Dembowske

ENGINEER: Mr. Greg Carli

Conestoga-Rovers & Associates

Conestoga-Rovers & Associates

4141 Davis Creek Court

261 Martindale Rd., Unit #3

Kalamazoo, MI 49001

St. Catherines, ON L2W 1A2

SUPPLIER: Mid-America Lining

SUBCONTRACTOR: TRI/ Environmental Inc.

9063 Bee Cave Road

Austin, TX 78733

MANUFACTURER: Agru America

| QTY | SPEC. NO. & TITLE       | DWG. NO. | DESCRIPTION / LOCATION INSTALLED                           |
|-----|-------------------------|----------|--|
| 1   | 02072 LLDPE Geomembrane |          | Textured 40 mil Liner - Testing Peel and Shear – 5th Batch |
|     |                         |          |  |

### CONSTRUCTION MANAGER'S / ENGINEER'S REVIEW AND APPROVAL:

COPY TO: File 056913

SIGNED:

COMPLETED BY: Jodie Dembowske

[Please Print]



TRI/Environmental, Inc.  
A Texas Research International Company

---

Date: 2010-10-06

**Mail To:**  
**Jodie Dembowske**  
**Conestoga Rovers and Associates**  
**4141 DAVIS Creek Road**  
**Kalamazoo , MI , 49001**

e-mail:jdembowske@craworld.com

Dear Dembowske,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

**Project:** **12th Street Landfill**

TRI Job Reference Number: **4249**

Material(s) Tested: (7) Heat Fusion Weld Seam(s)  
(1) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear  
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

**Codes:**

|         |   |
|---------|---|
| AD      | Adhesion Failure (100% Peel)                                    |
| BRK     | Break in sheeting away from Seam edge.                          |
| SE      | Break in sheeting at edge of seam.                              |
| AD-BRK  | Break in sheeting after some adhesion failure - partial peel.   |
| SIP     | Separation in the plane of the sheet (leaving the bond intact). |
| FTB     | Film tearing bond (all non "AD" failures).                      |
| NON-FTB | 100% peel.  |

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer T. Tenney".

Jennifer Tenney  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstestinginc.com>



TRI/Environmental, Inc.  
A Texas Research International Company

### DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Conestoga Rovers and Associates

Project: 12th Street Landfill

Material: 40mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 4249

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-23   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 92                    | 91  | 84  | 91  | 86  | 89   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 89                    | 85  | 87  | 88  | 89  | 88   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 108                   | 108 | 105 | 105 | 107 | 107  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |
| <b>Sample ID: DS-24   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 95                    | 94  | 91  | 98  | 93  | 94   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 92                    | 93  | 91  | 94  | 94  | 93   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 90                    | 96  | 96  | 96  | 95  | 95   |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |

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TRI/Environmental, Inc.  
A Texas Research International Company

### DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Conestoga Rovers and Associates

Project: 12th Street Landfill

Material: 40mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 4249

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-25   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 95                    | 94  | 91  | 89  | 95  | 93   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 89                    | 90  | 96  | 100 | 99  | 95   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 119                   | 115 | 117 | 113 | 115 | 116  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |
| <b>Sample ID: DS-26   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 84                    | 102 | 93  | 82  | 95  | 91   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 92                    | 92  | 93  | 90  | 92  | 92   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  | SE   |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB | FTB  |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 112                   | 110 | 111 | 112 | 114 | 112  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |

The testing is based upon accepted industry practices as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claims as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.



TRI/Environmental, Inc.  
A Texas Research International Company

### DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Conestoga Rovers and Associates

Project: 12th Street Landfill

Material: 40mil. LLDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 4249

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-27   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 86                    | 86  | 87  | 85  | 89  | 87   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 93                    | 83  | 91  | 83  | 83  | 87   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 113                   | 113 | 117 | 114 | 112 | 114  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |      |  |
| <b>Sample ID: DS-28   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 82                    | 81  | 81  | 84  | 80  | 82   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 86                    | 96  | 90  | 85  | 91  | 90   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 108                   | 108 | 108 | 108 | 112 | 109  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |      |  |

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TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates  
Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4249**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-29   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 85                    | 84  | 86  | 92  | 85  | 86   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 108                   | 96  | 105 | 96  | 95  | 100  |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 109                   | 115 | 116 | 110 | 111 | 112  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |      |  |

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TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40 mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4249**

| PARAMETER  | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|--|-----------------------|-----|-----|-----|-----|------|--|
|  | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-30   Weld: Single Extrusion</b> |                       |     |     |     |     |      |  |
| <b>Side: Peel</b>                                |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                              | 89                    | 91  | 85  | 101 | 86  | 90   |  |
| Peel Incursion (%)                               | <5%                   | <5% | <5% | <5% | <5% |      |  |
| Peel Locus Of Failure Code                       | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                            | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                     |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                             | 84                    | 89  | 87  | 101 | 81  | 89   |  |
| Shear Elongation @ Break (%)                     | >50                   | >50 | >50 | >50 | >50 |      |  |

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**PREPARED BY:**



# **CONESTOGA-ROVERS & ASSOCIATES**

4141 Davis Creek Court  
Kalamazoo, MI 49001-0838  
Telephone: (269) 344-1230  
[www.CRAworld.com](http://www.CRAworld.com)

Fax: (269) 344-8558

**SUBMITTAL**

**DATE:** October 8, 2010

SUBMITTAL No.: 56913-50

PROJECT NO.: 56913

**PROJECT NAME:** 12<sup>th</sup> Street Landfill

## CONSTRUCTION

**MANAGER:** Jodie Dembowske  
Conestoga-Rovers & Associates  
4141 Davis Creek Court  
Kalamazoo, MI 49001

**ENGINEER:** Mr. Greg Carli  
Conestoga-Rovers & Associates  
261 Martindale Rd., Unit #3  
St. Catherines, ON L2W 1A2

**SUPPLIER:** Mid-America Lining

**SUBCONTRACTOR:** TRI/ Environmental Inc.  
9063 Bee Cave Road  
Austin, TX 78733

**MANUFACTURER:** Agru America

| QTY | SPEC. NO. & TITLE       | DWG. NO. | DESCRIPTION / LOCATION INSTALLED   |
|-----|-------------------------|----------|--|
| 1   | 02072 LLDPE Geomembrane |          | Textured 40 mil Liner - Testing Peel and Shear – 6 <sup>th</sup> and Final Batch |
|     |                         |          |  |

## **CONSTRUCTION MANAGER'S / ENGINEER'S REVIEW AND APPROVAL:**

**COPY TO:** File 056913

**COMPLETED BY:** Jodie Dembowske [Please Print]

SIGNED: Jodie Dominique



TRI/Environmental, Inc.  
A Texas Research International Company

---

Date: 2010-10-07

**Mail To:**

**Jodie Dembowske**  
**Conestoga Rovers and Associates**  
**4141 DAVIS Creek Road**  
**Kalamazoo , MI , 49001**

e-mail:jdembowske@craworld.com

**Bill To:**

**Conestoga Rovers and Associates**  
**Project # : 56913**

Dear Dembowske,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

**Project:** **12th Street Landfill**

TRI Job Reference Number: **4263**

Material(s) Tested: (4) Heat Fusion Weld Seam(s)  
(2) Single Extrusion Weld Seam(s)

Test(s) Requested: SAME DAY Peel and Shear  
(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

**Codes:**

|         |   |
|---------|---|
| AD      | Adhesion Failure (100% Peel)                                    |
| BRK     | Break in sheeting away from Seam edge.                          |
| SE      | Break in sheeting at edge of seam.                              |
| AD-BRK  | Break in sheeting after some adhesion failure - partial peel.   |
| SIP     | Separation in the plane of the sheet (leaving the bond intact). |
| FTB     | Film tearing bond (all non "AD" failures).                      |
| NON-FTB | 100% peel.  |

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

A handwritten signature in black ink that reads "Melissa Hunter".

Melissa Hunter  
Project Manager  
Geosynthetic Services Division  
<http://www.geosyntheticstestinginc.com>



TRI/Environmental, Inc.  
A Texas Research International Company

**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4263**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-31   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 86                    | 85  | 87  | 92  | 89  | 88   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 81                    | 85  | 84  | 85  | 85  | 84   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 105                   | 105 | 105 | 100 | 108 | 105  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |
| <b>Sample ID: DS-32   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 96                    | 84  | 84  | 84  | 89  | 87   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 82                    | 86  | 86  | 87  | 89  | 86   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  | <5   |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 87                    | 86  | 87  | 93  | 94  | 89   |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 | >50  |  |

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**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4263**

| PARAMETER                                   | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|---|-----------------------|-----|-----|-----|-----|------|--|
|   | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-33   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 93                    | 89  | 93  | 87  | 91  | 91   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 81                    | 89  | 88  | 82  | 90  | 86   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 111                   | 109 | 115 | 112 | 115 | 112  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |      |  |
| <b>Sample ID: DS-34   Weld: Heat Fusion</b> |                       |     |     |     |     |      |  |
| <b>Side: A</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 86                    | 85  | 86  | 91  | 84  | 86   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Side: B</b>                              |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                         | 84                    | 81  | 87  | 79  | 83  | 83   |  |
| Peel Incursion (%)                          | <5                    | <5  | <5  | <5  | <5  |      |  |
| Peel Locus Of Failure Code                  | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                       | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                        | 106                   | 105 | 108 | 108 | 109 | 107  |  |
| Shear Elongation @ Break (%)                | >50                   | >50 | >50 | >50 | >50 |      |  |

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**DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK**

**TRI Client: Conestoga Rovers and Associates**

**Project: 12th Street Landfill**

**Material: 40 mil. LLDPE**

**SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)**

**TRI Log#: 4263**

| PARAMETER  | TEST REPLICATE NUMBER |     |     |     |     | MEAN |  |
|--|-----------------------|-----|-----|-----|-----|------|--|
|  | 1                     | 2   | 3   | 4   | 5   |      |  |
| <b>Sample ID: DS-35   Weld: Single Extrusion</b> |                       |     |     |     |     |      |  |
| <b>Side: Peel</b>                                |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                              | 107                   | 103 | 91  | 102 | 92  | 99   |  |
| Peel Incursion (%)                               | <5%                   | <5% | <5% | <5% | <5% |      |  |
| Peel Locus Of Failure Code                       | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                            | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                     |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                             | 108                   | 97  | 93  | 101 | 95  | 99   |  |
| Shear Elongation @ Break (%)                     | >50                   | >50 | >50 | >50 | >50 |      |  |
| <b>Sample ID: DS-36   Weld: Single Extrusion</b> |                       |     |     |     |     |      |  |
| <b>Side: Peel</b>                                |                       |     |     |     |     |      |  |
| Peel Strength (ppi)                              | 90                    | 102 | 99  | 116 | 77  | 97   |  |
| Peel Incursion (%)                               | <5%                   | <5% | <5% | <5% | <5% |      |  |
| Peel Locus Of Failure Code                       | SE                    | SE  | SE  | SE  | SE  |      |  |
| Peel NSF Failure Code                            | FTB                   | FTB | FTB | FTB | FTB |      |  |
| <b>Shear</b>                                     |                       |     |     |     |     |      |  |
| Shear Strength (ppi)                             | 93                    | 103 | 96  | 88  | 95  | 95   |  |
| Shear Elongation @ Break (%)                     | >50                   | >50 | >50 | >50 | >50 |      |  |

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**Mid - America Lining Co.**

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**Panel Placement Log**

Project Name: 12 th Street Landfill

Date: 9/15/2010

Project Location: Otsego Twp., MI.

Material Description: 40 Mil LLDPE Tx

| Panel Number | Roll Number | Panel Length | Panel Width | Square Footage | Comments |
|--------------|-------------|--------------|-------------|----------------|----------|
| 1            | 3216        | 205          | 22.5        | 4612.5         |          |
| 2            | 3216        | 204          | 22.5        | 4590           |          |
| 3            | 3216        | 204          | 22.5        | 4590           |          |
| 4            | 3115        | 126          | 22.5        | 2835           |          |
| 5            | 3115        | 98           | 22.5        | 2205           |          |
| 6            | 3115        | 66           | 22.5        | 1485           |          |
| 7            | 3115        | 34           | 22.5        | 765            |          |
| 8            | 3216        | 18           | 16          | 144            |          |
| 9            | 3115        | 150          | 22.5        | 3375           |          |
| 10           | 3111        | 148          | 22.5        | 3330           |          |
| 11           | 3111        | 143          | 22.5        | 3217.5         |          |
| 12           | 3111        | 125          | 22.5        | 2812.5         |          |
| 13           | 3111        | 100          | 22.5        | 2250           |          |
| 14           | 3111        | 77           | 22.5        | 1732.5         |          |
| 15           | 3111        | 54           | 22.5        | 1215           |          |
| 16           | 3111        | 30           | 22.5        | 675            |          |
| 17           | 3111        | 18           | 14          | 126            |          |
| 18           | 3218        | 206          | 22.5        | 4635           |          |
| 19           | 3218        | 140          | 22.5        | 3150           |          |
| 20           | 3218        | 102          | 22.5        | 2295           |          |

12/00 - E.D.R.

Daily Square Footage

Cont.

Square Footage to Date

Cont.

Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

Page: 2

**Panel Placement Log**

Project Name: 12 th Street Landfill

Date: 9/15/2010

Project Location: Otsego Twp., MI.

Material Description: 40 Mil LLDPE Tx

| Panel Number | Roll Number | Panel Length | Panel Width | Square Footage | Comments |
|--------------|-------------|--------------|-------------|----------------|----------|
| 21           | 3218        | 66           | 22.5        | 1485           |          |
| 22           | 3218        | 48           | 22.5        | 540            |          |
| 23           | 3218        | 14           | 18          | 126            |          |
| 24           | 3112        | 112          | 22.5        | 2520           |          |
| 25           | 3112        | 111          | 22.5        | 2497.5         |          |
| 26           | 3112        | 103          | 22.5        | 2317.5         |          |
| 27           | 3112        | 88           | 22.5        | 1980           |          |
| 28           | 3112        | 73           | 22.5        | 1642.5         |          |
| 29           | 3112        | 58           | 22.5        | 1305           |          |
| 30           | 3112        | 43           | 22.5        | 967.5          |          |
| 31           | 3112        | 26           | 22.5        | 585            |          |
| 32           | 3112        | 18           | 22          | 198            |          |
| 33           | 3110        | 140          | 22.5        | 3150           |          |
| 34           | 3110        | 132          | 22.5        | 2970           |          |
| 35           | 3110        | 116          | 22.5        | 2610           |          |
| 36           | 3110        | 100          | 22.5        | 2250           |          |
| 37           | 3110        | 87           | 22.5        | 1957.5         |          |
| 38           | 3110        | 56           | 22.5        | 1260           |          |
| 39           | 3218        | 24           | 22.5        | 540            |          |
|              |             |              |             |                |          |

12/00 - E.D.R.

Daily Square Footage

80,942

Square Footage to Date

80,942

Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

Page: 3

**Panel Placement Log**

Project Name: 12 th Street Landfill

Date: 9/17/2010

Project Location: Otsego Twp., MI.

Material Description: 40 Mil LLDPE Tx

| Panel Number | Roll Number | Panel Length | Panel Width | Square Footage | Comments |
|--------------|-------------|--------------|-------------|----------------|----------|
| 40           | 3113        | 168          | 22.5        | 3780           |          |
| 41           | 3113        | 154          | 22.5        | 3465           |          |
| 42           | 3113        | 118          | 22.5        | 2655           |          |
| 43           | 3113        | 62           | 22.5        | 1395           |          |
| 44           | 3113        | 112          | 22.5        | 2520           |          |
| 45           | 3220        | 54           | 22.5        | 1215           |          |
| 46           | 3220        | 166          | 22.5        | 3735           |          |
| 47           | 3220        | 170          | 22.5        | 3825           |          |
| 48           | 3220        | 171          | 22.5        | 3847.5         |          |
| 49           | 3220        | 116          | 22.5        | 2610           |          |
| 50           | 3107        | 54           | 22.5        | 1215           |          |
| 51           | 3107        | 171          | 22.5        | 3847.5         |          |
| 52           | 3107        | 172          | 22.5        | 3870           |          |
| 53           | 3107        | 172          | 22.5        | 3870           |          |
| 54           | 3107        | 62           | 22.5        | 1395           |          |
| 55           | 3219        | 61           | 22.5        | 1372.5         |          |
| 56           | 3219        | 59           | 22.5        | 1327.5         |          |
| 57           | 3219        | 54           | 22.5        | 1215           |          |
| 58           | 3219        | 41           | 22.5        | 922.5          |          |
| 59           | 3219        | 60           | 22.5        | 1350           |          |

12/00 - E.D.R.

Daily Square Footage

Cont.

Square Footage to Date

Cont.

Q.C. Initials: E.D.R.



## *Mid - America Lining Co.*

Page:          4

## *Panel Placement Log*

Project Name: 12 th Street Landfill

Date: 9/17/2010

Project Location: \_\_\_\_\_ Otsego Twp., MI.

Material Description: 40 Mil LLDPE Tx

12/00 - E.D.R.

## Daily Square Footage

50,378

## Square Footage to Date

131,320

Q.C. Initials: E.D.R.



# *Mid - America Lining Co.*

Page:        5

## *Panel Placement Log*

Project Name: 12 th Street Landfill

Date: 9/21/2010

Project Location: \_\_\_\_\_ Otsego Twp., MI.

Material Description: 40 Mil LLDPE Tx

12/00 - E.D.R.

## Daily Square Footage

27,945

## Square Footage to Date

159,265

Q.C. Initials: E.D.R.



# *Mid - America Lining Co.*

Page: 6

## *Panel Placement Log*

Project Name: 12 th Street Landfill

Date: 9/23/2010

Project Location: \_\_\_\_\_ Otsego Twp., MI.

Material Description: 40 Mil LLDPE Tx

12/00 - E.D.R.

## Daily Square Footage

25,623

## Square Footage to Date

184,888

Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

**TRIAL WELD LOG**

Page: 1

Project Name: 12th Street Landfill Project Location: Ostego Twp., MI. Material Description: 40 Mil LLDPE

| Mat.<br>Type | Date /<br>Time   | Ambient<br>Temp. | Seamer<br>Initials | Machine<br>Number | Extrusion Welds |                  | Fusion Welds   |                  | Peel Values<br>Lbs. / Inch |            |          | Shear Values<br>Lbs. / Inch |     |     | (P / F) |
|--------------|------------------|------------------|--------------------|-------------------|-----------------|------------------|----------------|------------------|----------------------------|------------|----------|-----------------------------|-----|-----|---------|
|              |                  |                  |                    |                   | Barrel<br>Temp. | Preheat<br>Temp. | Wedge<br>Temp. | Speed<br>Setting |                            |            |          |                             |     |     |         |
| S/S          | 9/15/10<br>8.02  | 50               | RM                 | D - 3             | N / A           | N / A            | 750            | 600              | 80<br>86                   | 87<br>89   | 86<br>86 | 110                         | 114 | 115 | P       |
| T/T          | 9/15/10<br>8.05  | 50               | RM                 | D - 3             | N / A           | N / A            | 750            | 600              | 82<br>92                   | 85<br>87   | 86<br>93 | 89                          | 91  | 93  | P       |
| S/S          | 9/15/10<br>8.10  | 50               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 81<br>91                   | 84<br>86   | 88<br>91 | 111                         | 112 | 114 | P       |
| S/T          | 9/15/10<br>8.05  | 50               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 90<br>91                   | 86<br>89   | 87<br>88 | 94                          | 96  | 98  | P       |
| S/S          | 9/15/10<br>13.20 | 75               | RM                 | D - 3             | N / A           | N / A            | 750            | 600              | 76<br>78                   | 76<br>77   | 79<br>83 | 89                          | 97  | 98  | P       |
| T/T          | 9/15/10<br>13.25 | 75               | RM                 | D - 3             | N / A           | N / A            | 750            | 600              | 77<br>77                   | 85<br>91   | 92<br>96 | 86                          | 88  | 103 | P       |
| S/S          | 9/15/10<br>13.15 | 75               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 74<br>76                   | 100<br>107 | 75<br>83 | 110                         | 107 | 113 | P       |
| T/T          | 9/15/10<br>13.20 | 75               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 86<br>94                   | 83<br>89   | 77<br>85 | 90                          | 91  | 99  | P       |
| T/T          | 9/17/10<br>10.20 | 70               | HM                 | MX - 1            | 400             | 200              | N / A          | N / A            | 63                         | 66         | 80       | 84                          | 84  | 90  | P       |
| T/T          | 9/17/10<br>13.25 | 80               | HM                 | MX - 1            | 400             | 300              | N / A          | N / A            | 76                         | 76         | 82       | 76                          | 82  | 89  | P       |
| S/S          | 9/17/10<br>13.55 | 80               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 79<br>87                   | 75<br>89   | 76<br>87 | 91                          | 91  | 95  | P       |
| T/T          | 9/17/10<br>13.50 | 80               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 72<br>89                   | 67<br>90   | 62<br>81 | 89                          | 90  | 98  | P       |
| S/S          | 9/17/10<br>13.55 | 80               | RM                 | D - 3             | N / A           | N / A            | 750            | 550              | 89<br>85                   | 84<br>89   | 87<br>89 | 103                         | 104 | 104 | P       |
| T/T          | 9/17/10<br>13.50 | 80               | RM                 | D - 3             | N / A           | N / A            | 750            | 550              | 88<br>89                   | 85<br>93   | 92<br>93 | 94                          | 103 | 108 | P       |
| T/T          | 9/19/10<br>11.40 | 70               | HM                 | MX - 1            | 400             | 300              | N / A          | N / A            | 63                         | 70         | 76       | 77                          | 79  | 81  | P       |



**Mid - America Lining Co.**

**TRIAL WELD LOG**

Page: 2

Project Name: 12th Street Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

| Mat.<br>Type   | Date /<br>Time   | Ambient<br>Temp. | Seamer<br>Initials | Machine<br>Number | Extrusion Welds |                  | Fusion Welds   |                  | Peel Values<br>Lbs. / Inch |    |    | Shear Values<br>Lbs. / Inch |     |     | (P / F) |
|----------------|------------------|------------------|--------------------|-------------------|-----------------|------------------|----------------|------------------|----------------------------|----|----|-----------------------------|-----|-----|---------|
|                |                  |                  |                    |                   | Barrel<br>Temp. | Preheat<br>Temp. | Wedge<br>Temp. | Speed<br>Setting | 79                         | 81 | 87 | 79                          | 80  | 82  |         |
| T/T            | 9/19/10<br>14.20 | 75               | HM                 | MX - 1            | 400             | 300              | N / A          | N / A            | 89                         | 91 | 95 | 93                          | 93  | 98  | P       |
| T/T            | 9/20/10<br>8.10  | 65               | HM                 | MX - 1            | 400             | 300              | N / A          | N / A            | 80                         | 83 | 84 | 102                         | 103 | 107 | P       |
| T/T            | 9/21/10<br>8.05  | 65               | RM                 | D - 3             | N / A           | N / A            | 750            | 500              | 91                         | 88 | 85 | 83                          | 85  | 90  | P       |
| S/S            | 9/21/10<br>8.00  | 65               | RM                 | D - 3             | N / A           | N / A            | 750            | 500              | 80                         | 83 | 84 | 77                          | 85  | 85  | P       |
| S/S            | 9/21/10<br>8.10  | 65               | MR                 | D - 5             | N / A           | N / A            | 750            | 500              | 80                         | 90 | 89 | 105                         | 105 | 108 | P       |
| T/T            | 9/21/10<br>8.05  | 65               | MR                 | D - 5             | N / A           | N / A            | 750            | 500              | 79                         | 76 | 76 | 86                          | 89  | 92  | P       |
| S/T            | 9/21/10<br>8.23  | 65               | RM                 | D - 3             | N / A           | N / A            | 750            | 500              | 78                         | 82 | 79 | 85                          | 92  | 107 | P       |
| T/T            | 9/21/10<br>13.10 | 80               | HM                 | MX - 1            | 400             | 300              | N / A          | N / A            | 68                         | 70 | 72 | 69                          | 72  | 81  | P       |
| T/T            | 9/21/10<br>13.45 | 80               | SS                 | MX - 9            | 300             | 200              | N / A          | N / A            | 66                         | 69 | 71 | 64                          | 64  | 70  | P       |
| S/S            | 9/23/10<br>8.15  | 65               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 84                         | 81 | 84 | 104                         | 107 | 108 | P       |
| T/T            | 9/23/10<br>8.20  | 65               | MR                 | D - 5             | N / A           | N / A            | 750            | 600              | 86                         | 85 | 86 | 92                          | 96  | 104 | P       |
| S/S            | 9/23/10<br>8.20  | 65               | RM                 | D - 3             | N / A           | N / A            | 750            | 550              | 79                         | 83 | 88 | 106                         | 108 | 109 | P       |
| T/T            | 9/23/10<br>8.25  | 65               | RM                 | D - 3             | N / A           | N / A            | 750            | 500              | 88                         | 87 | 91 | 106                         | 110 | 111 | P       |
| T/T            | 9/23/10<br>17.10 | 85               | HM                 | MX - 1            | 400             | 300              | N / A          | N / A            | 92                         | 89 | 91 | 78                          | 79  | 92  | P       |
| T/T            | 9/23/10<br>17.30 | 85               | SS                 | MX - 9            | 300             | 200              | N / A          | N / A            | 75                         | 75 | 75 | 72                          | 75  | 76  | P       |
| 12/00 - E.D.R. |                  |                  |                    |                   |                 |                  |                |                  |                            |    |    |                             |     |     |         |

Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

**PANEL SEAMING FORM**

**Page:** 1

Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments            |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|---------------------|
| 9/15/2010<br>9.43  | 9/10        | 150         | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>13.08 | 10/11       | 146         | RM              | D - 3          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>10.05 | 11/12       | 138         | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>10.25 | 12/13       | 112         | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>10.31 | 13/14       | 88          | RM              | D - 3          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>10.45 | 14/15       | 66          | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>10.50 | 15/16       | 42          | RM              | D - 3          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>11.05 | 16/17       | 18          | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>8.57  | 3/4         | 138         | RM              | D - 3          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>9.00  | 4/5         | 114         | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>9.21  | 5/6         | 82          | RM              | D - 3          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>9.20  | 6/7         | 50          | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>9.40  | 7/8         | 18          | MR              | D - 5          | 750           | Cool    | 5-15  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>11.17 | 3/9         | 22          | RM              | D - 3          | 750           | Cool    | 5-10  | 75            | P           | Textured / Textured |
| 9/15/2010<br>11.21 | 3/10        | 22          | RM              | D - 3          | 750           | Cool    | 5-10  | 75            | P           | Textured / Textured |

12/00 - E.D.R.

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**Mid - America Lining Co.**

**PANEL SEAMING FORM**

**Page:** 2

Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments            |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|---------------------|
| 9/15/2010<br>11.24 | 3/11        | 22          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.27 | 4/12        | 34          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.36 | 5/13        | 30          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.40 | 5/14        | 7           | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.41 | 6/14        | 23          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.44 | 6/15        | 16          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.47 | 7/15        | 14          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.49 | 7/16        | 45          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.53 | 8/16        | 5           | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>11.53 | 8/17        | 18          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>8.30  | 3/2         | 204         | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>8.25  | 2/1         | 204         | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>11.20 | 1/18        | 206         | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>13.36 | 18/19       | 160         | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>14.01 | 19/20       | 121         | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |

12/00 - E.D.R.

QC Initials : E.D.R.



**Mid - America Lining Co.**

**PANEL SEAMING FORM**

**Page:** 3

Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments            |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|---------------------|
| 9/15/2010<br>13.45 | 20/21       | 84          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>14.00 | 21/22       | 48          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>16.38 | 23/32       | 16          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.36 | 22/32       | 13          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.32 | 22/31       | 29          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.30 | 21/30       | 29          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.26 | 21/29       | 17          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.25 | 20/29       | 11          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.21 | 20/28       | 29          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.20 | 20/27       | 6           | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.17 | 19/27       | 23          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.13 | 19/26       | 27          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.08 | 18/25       | 23          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.04 | 18/24       | 17          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/15/2010<br>16.25 | 1/33        | 22          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Textured / Smooth   |

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QC Initials : E.D.R.



**Mid - America Lining Co.**

**PANEL SEAMING FORM**

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Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments          |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|-------------------|
| 9/15/2010<br>16.29 | 18/33       | 22          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Textured / Smooth |
| 9/15/2010<br>16.33 | 24/33       | 112         | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>14.12 | 22/23       | 14          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>14.43 | 24/25       | 112         | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>14.45 | 25/26       | 110         | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>15.02 | 26/27       | 97          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>15.05 | 27/28       | 80          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>15.22 | 28/29       | 66          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>15.25 | 29/30       | 51          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>15.40 | 30/31       | 34          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>15.40 | 31/32       | 18          | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>16.55 | 33/34       | 140         | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>17.17 | 34/35       | 124         | MR              | D - 5          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>17.29 | 35/36       | 108         | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |
| 9/15/2010<br>16.52 | 36/37       | 94          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth   |

12/00 - E.D.R.

QC Initials : E.D.R.



**Mid - America Lining Co.**

**PANEL SEAMING FORM**

**Page:** 5

Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments            |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|---------------------|
| 9/15/2010<br>17.20 | 37/38       | 56          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>17.17 | 37/39       | 80          | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Smooth / Smooth     |
| 9/15/2010<br>17.10 | 38/39       | 22.5        | RM              | D - 3          | 750           | Cool    | 5-10  | 70            | P           | Textured / Textured |
| 9/17/2010<br>14.20 | 42/43       | 98          | RM              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>14.20 | 41/42       | 140         | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>14.40 | 40/41       | 169         | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>14.50 | 40/44       | 112         | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>14.43 | 40/45       | 55          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>14.36 | 44/45       | 22.5        | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Textured / Textured |
| 9/17/2010<br>15.13 | 44/46       | 112         | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>15.05 | 45/46       | 53          | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>15.12 | 46/47       | 168         | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>15.40 | 47/48       | 172         | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>15.55 | 48/49       | 116         | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>15.47 | 48/50       | 54          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |

12/00 - E.D.R.

QC Initials : E.D.R.



**Mid - America Lining Co.**

**PANEL SEAMING FORM**

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Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments            |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|---------------------|
| 9/17/2010<br>15.42 | 49/50       | 22.5        | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Textured / Textured |
| 9/17/2010<br>16.14 | 49/51       | 116         | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>16.10 | 50/51       | 54          | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>16.19 | 51/52       | 172         | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>16.35 | 52/53       | 172         | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>16.43 | 54/55       | 62          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>16.54 | 55/56       | 60          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>17.00 | 56/57       | 58          | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>17.26 | 57/58       | 50          | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>17.30 | 59/60       | 42          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>17.40 | 60/61       | 30          | MR              | D - 5          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth     |
| 9/17/2010<br>17.40 | 53/54       | 21          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Textured   |
| 9/17/2010<br>17.46 | 53/55       | 23          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Textured   |
| 9/17/2010<br>17.50 | 53/56       | 23          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Textured   |
| 9/17/2010<br>17.53 | 53/57       | 16          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Textured   |

12/00 - E.D.R.

QC Initials : E.D.R.



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**PANEL SEAMING FORM**

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Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments                      |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|-------------------------------|
| 9/17/2010<br>17.55 | 53/59       | 78          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth               |
| 9/17/2010<br>17.50 | 57/58       | 9           | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Smooth               |
| 9/17/2010<br>17.51 | 58/59       | 28          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Textured / Textured           |
| 9/17/2010<br>17.57 | 58/60       | 23          | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Textured             |
| 9/17/2010<br>18.01 | 58/61       | 9           | RM              | D - 3          | 750           | Sunny   | 5-10  | 75            | P           | Smooth / Textured             |
| 9/17/2010<br>17.40 | 33/41       | 26          | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/17/2010<br>17.45 | 34/41       | 9           | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/17/2010<br>17.47 | 34/42       | 18          | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/17/2010<br>17.50 | 35/42       | 29          | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/17/2010<br>18.00 | 36/43       | 27          | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/17/2010<br>18.10 | 37/43       | 22          | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/17/2010<br>18.20 | 38/43       | 23          | HM              | MX - 1         | 400           | Sunny   | 5-10  | 75            | P           | Extrusion Weld VTOK - 9/19 BL |
| 9/21/2010<br>10.07 | 9/62        | 156         | RM              | D - 3          | 750           | Sunny   | 10-20 | 80            | P           | Smooth / Textured             |
| 9/21/2010<br>10.04 | 3/62        | 22          | RM              | D - 3          | 750           | Sunny   | 10-20 | 80            | P           | Textured / Textured           |
| 9/21/2010<br>9.56  | 2/62        | 23          | RM              | D - 3          | 750           | Sunny   | 10-20 | 80            | P           | Smooth / Textured             |



**Mid - America Lining Co.**

**PANEL SEAMING FORM**

**Page:** 8

Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE

| Date / Time        | Seam Number | Seam Length | Seamer Initials | Machine Number | Temp. Setting | Weather | Winds | Ambient Temp. | DS Test P/F | Comments                      |
|--------------------|-------------|-------------|-----------------|----------------|---------------|---------|-------|---------------|-------------|-------------------------------|
| 9/21/2010<br>8.41  | 62/63       | 166         | RM              | D - 3          | 750           | Humid   | 10-20 | 75            | P           | Smooth / Smooth               |
| 9/21/2010<br>8.36  | 62/64       | 38          | RM              | D - 3          | 750           | Humid   | 10-20 | 75            | P           | Smooth / Smooth               |
| 9/21/2010<br>8.35  | 63/64       | 22.5        | MR              | D - 5          | 750           | Humid   | 10-20 | 75            | P           | Textured / Textured           |
| 9/21/2010<br>8.43  | 63/65       | 166         | MR              | D - 5          | 750           | Humid   | 10-20 | 75            | P           | Smooth / Smooth               |
| 9/21/2010<br>8.40  | 64/65       | 41          | MR              | D - 5          | 750           | Humid   | 10-20 | 75            | P           | Smooth / Smooth               |
| 9/21/2010<br>9.16  | 65/66       | 209         | RM              | D - 3          | 750           | Humid   | 10-20 | 80            | P           | Smooth / Smooth               |
| 9/21/2010<br>9.15  | 66/67       | 208         | MR              | D - 5          | 750           | Humid   | 10-20 | 80            | P           | Smooth / Smooth               |
| 9/21/2010<br>9.55  | 67/68       | 208         | MR              | D - 5          | 750           | Humid   | 10-20 | 80            | P           | Smooth / Smooth               |
| 9/21/2010<br>14.00 | 33/62       | 22          | HM              | MX - 1         | 400           | Warm    | 10-20 | 80            | P           | Extrusion Weld VTOK - 9/21 BL |
| 9/21/2010<br>13.55 | 34/64       | 22          | HM              | MX - 1         | 400           | Warm    | 10-20 | 80            | P           | Extrusion Weld VTOK - 9/21 BL |
| 9/21/2010<br>13.50 | 35/65       | 23          | HM              | MX - 1         | 400           | Warm    | 10-20 | 80            | P           | Extrusion Weld VTOK - 9/21 BL |
| 9/21/2010<br>13.40 | 36/66       | 23          | HM              | MX - 1         | 400           | Warm    | 10-20 | 80            | P           | Extrusion Weld VTOK - 9/21 BL |
| 9/21/2010<br>13.35 | 37/67       | 23          | HM              | MX - 1         | 400           | Warm    | 10-20 | 80            | P           | Extrusion Weld VTOK - 9/21 BL |
| 9/21/2010<br>13.30 | 39/68       | 23          | HM              | MX - 1         | 400           | Warm    | 10-20 | 80            | P           | Extrusion Weld VTOK - 9/21 BL |
| 9/23/2010<br>9.27  | 68/69       | 42          | RM              | D - 3          | 750           | Humid   | 5-10  | 80            | P           | Smooth / Smooth               |



## *Mid - America Lining Co.*

## **PANEL SEAMING FORM**

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Project Name: 12 st Landfill Project Location: Otsego Twp, MI Material Description: 40 Mil LLDPE



**Mid - America Lining Co.**

**NON - DESTRUCTIVE TEST LOG**

**Page:** 1

Project Name: 12 st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

|             |             |                | Air Test Information |               |       |            |             |         |                     |
|-------------|-------------|----------------|----------------------|---------------|-------|------------|-------------|---------|---------------------|
|             |             |                | Pressure             |               |       | Time       |             | Results |                     |
| Date Tested | Seam Number | Tester Initial | Start P.S.I.         | Finish P.S.I. | + / - | Start Time | Finish Time | (P / F) | Comments            |
| 9/15/10     | 9/10        | ER             | 31                   | 30            | -1    | 13.50      | 13.57       | P       | Smooth / Smooth     |
| 9/15/10     | 10/11       | ER             | 34                   | 33            | -1    | 13.49      | 13.56       | P       | Smooth / Smooth     |
| 9/15/10     | 11/12       | ER             | 31                   | 28            | -3    | 13.49      | 13.56       | P       | Smooth / Smooth     |
| 9/15/10     | 12/13       | ER             | 31                   | 29            | -2    | 13.30      | 13.37       | P       | Smooth / Smooth     |
| 9/15/10     | 13/14       | ER             | 31                   | 30            | -1    | 13.30      | 13.37       | P       | Smooth / Smooth     |
| 9/15/10     | 14/15       | ER             | 30                   | 28            | -2    | 13.28      | 13.35       | P       | Smooth / Smooth     |
| 9/15/10     | 15/16       | ER             | 31                   | 29            | -2    | 13.28      | 13.35       | P       | Smooth / Smooth     |
| 9/15/10     | 16/17       | ER             | 31                   | 30            | -1    | 13.16      | 13.23       | P       | Smooth / Smooth     |
| 9/15/10     | 3/4         | ER             | 31                   | 30            | -1    | 10.48      | 10.55       | P       | Smooth / Smooth     |
| 9/15/10     | 4/5         | ER             | 31                   | 30            | -1    | 10.48      | 10.55       | P       | Smooth / Smooth     |
| 9/15/10     | 5/6         | ER             | 31                   | 29            | -2    | 13.15      | 13.22       | P       | Smooth / Smooth     |
| 9/15/10     | 6/7         | ER             | 34                   | 33            | -1    | 13.15      | 13.22       | P       | Smooth / Smooth     |
| 9/15/10     | 7/8         | ER             | 30                   | 29            | -1    | 13.15      | 13.22       | P       | Smooth / Smooth     |
| 9/15/10     | 3/9         | ER             | 31                   | 29            | -2    | 13.50      | 13.57       | P       | Textured / Textured |
| 9/15/10     | 3/10        | ER             | 30                   | 28            | -2    | 14.03      | 14.10       | P       | Textured / Textured |
| 9/15/10     | 3/11        | ER             | 30                   | 28            | -2    | 14.03      | 14.10       | P       | Textured / Textured |
| 9/15/10     | 5/13        | ER             | 32                   | 32            | 0     | 14.04      | 14.11       | P       | Textured / Textured |
| 9/15/10     | 6/14        | ER             | 31                   | 30            | -1    | 14.23      | 14.30       | P       | Textured / Textured |
| 9/15/10     | 6/15        | ER             | 35                   | 35            | 0     | 14.23      | 14.30       | P       | Textured / Textured |
| 9/15/10     | 7/15        | ER             | 30                   | 29            | -1    | 14.23      | 14.30       | P       | Textured / Textured |
| 9/15/10     | 7/16        | ER             | 30                   | 30            | 0     | 14.37      | 14.44       | P       | Textured / Textured |
| 9/15/10     | 8/16        | ER             | 32                   | 31            | -1    | 14.37      | 14.44       | P       | Textured / Textured |

12/00 - E.D.R.

Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

**NON - DESTRUCTIVE TEST LOG**

**Page:** 2

Project Name: 12 st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

| Date Tested | Seam Number | Tester Initial | Air Test Information |               |       |            |             |         | Comments            |
|-------------|-------------|----------------|----------------------|---------------|-------|------------|-------------|---------|---------------------|
|             |             |                | Start P.S.I.         | Finish P.S.I. | + / - | Start Time | Finish Time | (P / F) |                     |
| 9/15/10     | 8/17        | ER             | 34                   | 31            | -3    | 14.38      | 14.45       | P       | Textured / Textured |
| 9/15/10     | 2/3         | ER             | 30                   | 28            | -2    | 10.45      | 10.52       | P       | Smooth / Smooth     |
| 9/15/10     | 1/2         | ER             | 30                   | 28            | -2    | 10.45      | 10.52       | P       | Smooth / Smooth     |
| 9/17/10     | 1/18        | SS             | 31                   | 31            | 0     | 9.03       | 9.10        | P       | Smooth / Smooth     |
| 9/17/10     | 1/18        | SS             | 31                   | 28            | -3    | 10.11      | 10.18       | P       | Smooth / Smooth     |
| 9/17/10     | 18/19       | SS             | 31                   | 27            | -4    | 9.14       | 9.21        | P       | Smooth / Smooth     |
| 9/17/10     | 19/20       | SS             | 31                   | 30            | -1    | 9.24       | 9.31        | P       | Smooth / Smooth     |
| 9/17/10     | 20/21       | SS             | 31                   | 27            | -4    | 9.35       | 9.42        | P       | Smooth / Smooth     |
| 9/17/10     | 21/22       | SS             | 31                   | 28            | -3    | 9.43       | 9.50        | P       | Smooth / Smooth     |
| 9/17/10     | 22/23       | SS             | 31                   | 28            | -3    | 10.03      | 10.10       | P       | Smooth / Smooth     |
| 9/17/10     | 24/25       | SS             | 31                   | 29            | -2    | 8.52       | 8.59        | P       | Smooth / Smooth     |
| 9/17/10     | 25/26       | SS             | 31                   | 29            | -2    | 9.02       | 9.09        | P       | Smooth / Smooth     |
| 9/17/10     | 26/27       | SS             | 31                   | 29            | -2    | 9.15       | 9.22        | P       | Smooth / Smooth     |
| 9/17/10     | 27/28       | SS             | 31                   | 31            | 0     | 9.26       | 9.33        | P       | Smooth / Smooth     |
| 9/17/10     | 28/29       | SS             | 31                   | 28            | -3    | 9.33       | 9.40        | P       | Smooth / Smooth     |
| 9/17/10     | 29/30       | SS             | 31                   | 29            | -2    | 9.42       | 9.49        | P       | Smooth / Smooth     |
| 9/17/10     | 30/31       | SS             | 31                   | 28            | -3    | 9.54       | 10.01       | P       | Smooth / Smooth     |
| 9/17/10     | 31/32       | SS             | 31                   | 28            | -3    | 9.55       | 10.02       | P       | Smooth / Smooth     |
| 9/17/10     | 24/33       | SS             | 31                   | 29            | -2    | 8.50       | 8.57        | P       | Smooth / Smooth     |
| 9/17/10     | 33/34       | SS             | 31                   | 28            | -3    | 10.20      | 10.27       | P       | Smooth / Smooth     |
| 9/17/10     | 34/35       | SS             | 31                   | 31            | 0     | 10.20      | 10.27       | P       | Smooth / Smooth     |
| 9/17/10     | 35/36       | SS             | 31                   | 31            | 0     | 10.21      | 10.28       | P       | Smooth / Smooth     |

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**NON - DESTRUCTIVE TEST LOG**

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Project Name: 12 st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

| Date Tested | Seam Number | Tester Initial | Air Test Information |               |       |            |             |         | Comments            |
|-------------|-------------|----------------|----------------------|---------------|-------|------------|-------------|---------|---------------------|
|             |             |                | Start P.S.I.         | Finish P.S.I. | + / - | Start Time | Finish Time | (P / F) |                     |
| 9/17/10     | 36/37       | SS             | 31                   | 30            | -1    | 10.21      | 10.28       | P       | Smooth / Smooth     |
| 9/17/10     | 37/38       | SS             | 31                   | 30            | -1    | 10.30      | 10.37       | P       | Smooth / Smooth     |
| 9/17/10     | 37/39       | SS             | 31                   | 28            | -3    | 10.30      | 10.37       | P       | Smooth / Smooth     |
| 9/17/10     | 38/39       | SS             | 31                   | 30            | -1    | 10.30      | 10.37       | P       | Smooth / Smooth     |
| 9/17/10     | 23/32       | SS             | 31                   | 29            | -2    | 10.03      | 10.10       | P       | Textured / Textured |
| 9/17/10     | 22/32       | SS             | 31                   | 31            | 0     | 9.55       | 10.02       | P       | Textured / Textured |
| 9/17/10     | 22/31       | SS             | 31                   | 28            | -3    | 9.54       | 10.01       | P       | Textured / Textured |
| 9/17/10     | 21/30       | SS             | 31                   | 30            | -1    | 9.43       | 9.50        | P       | Textured / Textured |
| 9/17/10     | 21/29       | SS             | 31                   | 27            | -4    | 9.42       | 9.49        | P       | Textured / Textured |
| 9/17/10     | 20/29       | SS             | 31                   | 28            | -3    | 9.35       | 9.42        | P       | Textured / Textured |
| 9/17/10     | 20/28       | SS             | 31                   | 31            | 0     | 9.33       | 9.40        | P       | Textured / Textured |
| 9/17/10     | 20/27       | SS             | 31                   | 28            | -3    | 9.26       | 9.33        | P       | Textured / Textured |
| 9/17/10     | 19/27       | SS             | 31                   | 28            | -3    | 9.24       | 9.31        | P       | Textured / Textured |
| 9/17/10     | 19/27       | SS             | 31                   | 29            | -2    | 9.15       | 9.22        | P       | Textured / Textured |
| 9/17/10     | 19/26       | SS             | 31                   | 31            | 0     | 9.14       | 9.21        | P       | Textured / Textured |
| 9/17/10     | 18/25       | SS             | 31                   | 28            | -3    | 9.01       | 9.08        | P       | Textured / Textured |
| 9/17/10     | 18/24       | SS             | 31                   | 28            | -3    | 8.51       | 8.58        | P       | Textured / Textured |
| 9/17/10     | 1/33        | SS             | 31                   | 30            | -1    | 9.03       | 9.10        | P       | Smooth / Textured   |
| 9/17/10     | 18/33       | SS             | 31                   | 31            | 0     | 8.50       | 8.57        | P       | Smooth / Textured   |
| 9/17/10     | 40/41       | SS             | 31                   | 28            | -3    | 15.19      | 15.26       | P       | Smooth / Smooth     |
| 9/17/10     | 41/42       | SS             | 31                   | 30            | -1    | 15.18      | 15.25       | P       | Smooth / Smooth     |
| 9/17/10     | 42/43       | SS             | 31                   | 31            | 0     | 15.17      | 15.24       | P       | Smooth / Smooth     |

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**Mid - America Lining Co.**

**NON - DESTRUCTIVE TEST LOG**

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Project Name: 12 st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

| Date Tested | Seam Number | Tester Initial | Air Test Information |               |       |            |             |         | Comments          |
|-------------|-------------|----------------|----------------------|---------------|-------|------------|-------------|---------|-------------------|
|             |             |                | Start P.S.I.         | Finish P.S.I. | + / - | Start Time | Finish Time | (P / F) |                   |
| 9/17/10     | 40/44       | SS             | 31                   | 27            | -4    | 15.38      | 15.45       | P       | Smooth / Smooth   |
| 9/17/10     | 40/45       | SS             | 31                   | 28            | -3    | 15.20      | 15.27       | P       | Smooth / Smooth   |
| 9/17/10     | 44/45       | SS             | 31                   | 28            | -3    | 15.38      | 15.45       | P       | Smooth / Smooth   |
| 9/17/10     | 44/46       | SS             | 31                   | 28            | -3    | 15.40      | 15.47       | P       | Smooth / Smooth   |
| 9/17/10     | 45/46       | SS             | 31                   | 31            | 0     | 15.40      | 15.47       | P       | Smooth / Smooth   |
| 9/17/10     | 46/47       | SS             | 31                   | 29            | -2    | 15.48      | 15.55       | P       | Smooth / Smooth   |
| 9/17/10     | 47/48       | SS             | 31                   | 28            | -3    | 16.23      | 16.30       | P       | Smooth / Smooth   |
| 9/17/10     | 48/49       | SS             | 31                   | 31            | 0     | 16.50      | 16.57       | P       | Smooth / Smooth   |
| 9/17/10     | 48/50       | SS             | 31                   | 31            | 0     | 16.28      | 16.35       | P       | Smooth / Smooth   |
| 9/17/10     | 49/50       | SS             | 31                   | 29            | -2    | 16.40      | 16.47       | P       | Smooth / Smooth   |
| 9/17/10     | 49/51       | SS             | 31                   | 31            | 0     | 16.40      | 16.47       | P       | Smooth / Smooth   |
| 9/17/10     | 50/51       | SS             | 31                   | 29            | -2    | 16.45      | 16.52       | P       | Smooth / Smooth   |
| 9/17/10     | 51/52       | SS             | 31                   | 30            | -1    | 17.00      | 17.07       | P       | Smooth / Smooth   |
| 9/17/10     | 52/53       | SS             | 31                   | 29            | -2    | 17.00      | 17.07       | P       | Smooth / Smooth   |
| 9/17/10     | 54/55       | SS             | 31                   | 28            | -3    | 17.26      | 17.33       | P       | Smooth / Smooth   |
| 9/17/10     | 55/56       | SS             | 31                   | 31            | 0     | 17.27      | 17.34       | P       | Smooth / Smooth   |
| 9/17/10     | 56/57       | SS             | 31                   | 28            | -3    | 17.27      | 17.34       | P       | Smooth / Smooth   |
| 9/17/10     | 57/58       | SS             | 31                   | 30            | -1    | 17.37      | 17.44       | P       | Smooth / Smooth   |
| 9/17/10     | 59/60       | SS             | 31                   | 29            | -2    | 17.43      | 17.50       | P       | Smooth / Smooth   |
| 9/17/10     | 60/61       | SS             | 31                   | 30            | -1    | 17.47      | 17.54       | P       | Smooth / Smooth   |
| 9/19/10     | 53/54       | SS             | 31                   | 29            | -2    | 9.35       | 9.42        | P       | Smooth / Textured |
| 9/19/10     | 53/55       | SS             | 31                   | 30            | -1    | 9.35       | 9.42        | P       | Smooth / Textured |

12/00 - E.D.R.

Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

**NON - DESTRUCTIVE TEST LOG**

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Project Name: 12 st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

| Date Tested | Seam Number | Tester Initial | Air Test Information |               |       |            |             |         | Comments            |
|-------------|-------------|----------------|----------------------|---------------|-------|------------|-------------|---------|---------------------|
|             |             |                | Start P.S.I.         | Finish P.S.I. | + / - | Start Time | Finish Time | (P / F) |                     |
| 9/19/10     | 53/56       | SS             | 31                   | 29            | -2    | 9.36       | 9.43        | P       | Smooth / Textured   |
| 9/19/10     | 53/57       | SS             | 31                   | 29            | -2    | 9.36       | 9.43        | P       | Smooth / Textured   |
| 9/19/10     | 53/59       | SS             | 31                   | 31            | 0     | 9.37       | 9.44        | P       | Smooth / Smooth     |
| 9/19/10     | 57/59       | SS             | 31                   | 30            | -1    | 9.52       | 9.59        | P       | Textured / Textured |
| 9/19/10     | 58/59       | SS             | 31                   | 29            | -2    | 9.53       | 10.00       | P       | Textured / Textured |
| 9/19/10     | 58/60       | SS             | 31                   | 31            | 0     | 9.50       | 9.57        | P       | Smooth / Textured   |
| 9/19/10     | 58/61       | SS             | 31                   | 30            | -1    | 9.50       | 9.57        | P       | Smooth / Textured   |
| 9/21/10     | 9/62        | SS             | 31                   | 30            | -1    | 10.47      | 10.54       | P       | Smooth / Textured   |
| 9/21/10     | 3/62        | SS             | 31                   | 29            | -2    | 10.47      | 10.54       | P       | Textured / Textured |
| 9/21/10     | 2/62        | SS             | 31                   | 31            | 0     | 10.46      | 10.53       | P       | Smooth / Textured   |
| 9/21/10     | 62/63       | SS             | 31                   | 28            | -3    | 9.55       | 10.02       | P       | Smooth / Smooth     |
| 9/21/10     | 62/64       | SS             | 31                   | 30            | -1    | 9.58       | 10.05       | P       | Smooth / Smooth     |
| 9/21/10     | 63/64       | SS             | 31                   | 30            | -1    | 9.55       | 10.02       | P       | Textured / Textured |
| 9/21/10     | 63/65       | SS             | 31                   | 29            | -2    | 10.20      | 10.27       | P       | Smooth / Smooth     |
| 9/21/10     | 64/65       | SS             | 31                   | 31            | 0     | 10.08      | 10.15       | P       | Smooth / Smooth     |
| 9/21/10     | 65/66       | SS             | 31                   | 29            | -2    | 10.13      | 10.20       | P       | Smooth / Smooth     |
| 9/21/10     | 66/67       | SS             | 31                   | 29            | -2    | 10.13      | 10.20       | P       | Smooth / Smooth     |
| 9/21/10     | 67/68       | SS             | 31                   | 31            | 0     | 10.30      | 10.37       | P       | Smooth / Smooth     |
| 9/23/10     | 68/69       | SS             | 31                   | 28            | -3    | 10.50      | 10.57       | P       | Smooth / Smooth     |
| 9/23/10     | 68/70       | SS             | 31                   | 28            | -3    | 10.50      | 10.57       | P       | Smooth / Smooth     |
| 9/23/10     | 69/71       | SS             | 31                   | 31            | 0     | 10.52      | 10.59       | P       | Smooth / Smooth     |
| 9/23/10     | 70/71       | SS             | 31                   | 30            | -1    | 10.52      | 10.59       | P       | Smooth / Smooth     |

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# ***Mid - America Lining Co.***

## ***NON - DESTRUCTIVE TEST LOG***

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Project Name: 12 st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE



**Mid - America Lining Co.**

**FIELD DESTRUCTIVE TEST LOG**

**Page:** 1 **of:** 2

Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

| Date    | DS Number | Seam Number | Seamer Initials | Mach. Number | Peel Values - Lbs./Inches |    |     | Shear Values - Lbs./Inches |     |     | Field Pass | Lab Pass |
|---------|-----------|-------------|-----------------|--------------|---------------------------|----|-----|----------------------------|-----|-----|------------|----------|
| 9/15/10 | 1         | 2/3         | MR              | D - 5        | 81                        | 78 | 89  | 105                        | 114 | 116 | P          | P        |
|         |           |             |                 |              | 90                        | 87 | 91  |                            |     |     |            |          |
| 9/15/10 | 2         | 10/11       | MR              | D - 5        | 87                        | 93 | 72  | 115                        | 116 | 118 | P          | P        |
|         |           |             |                 |              | 90                        | 98 | 108 |                            |     |     |            |          |
| 9/15/10 | 3         | 5/6         | RM              | D - 3        | 92                        | 88 | 94  | 110                        | 117 | 119 | P          | P        |
|         |           |             |                 |              | 97                        | 95 | 100 |                            |     |     |            |          |
| 9/15/10 | 4         | 1/18        | MR              | D - 5        | 85                        | 78 | 85  | 105                        | 106 | 110 | P          | P        |
|         |           |             |                 |              | 88                        | 82 | 88  |                            |     |     |            |          |
| 9/15/10 | 5         | 24/25       | RM              | D - 3        | 73                        | 80 | 79  | 98                         | 100 | 101 | P          | P        |
|         |           |             |                 |              | 92                        | 86 | 84  |                            |     |     |            |          |
| 9/15/10 | 6         | 22/31       | RM              | D - 3        | 83                        | 78 | 81  | 76                         | 78  | 83  | P          | P        |
|         |           |             |                 |              | 84                        | 80 | 81  |                            |     |     |            |          |
| 9/15/10 | 7         | 33/34       | RM              | D - 3        | 90                        | 92 | 92  | 95                         | 95  | 101 | P          | P        |
|         |           |             |                 |              | 95                        | 96 | 99  |                            |     |     |            |          |
| 9/15/10 | 8         | 37/38       | MR              | D - 5        | 75                        | 83 | 74  | 99                         | 101 | 102 | P          | P        |
|         |           |             |                 |              | 93                        | 83 | 93  |                            |     |     |            |          |
| 9/17/10 | 9         | 40/41       | MR              | D - 5        | 70                        | 70 | 78  | 100                        | 101 | 103 | P          | P        |
|         |           |             |                 |              | 79                        | 79 | 79  |                            |     |     |            |          |
| 9/17/10 | 10        | 47/48       | MR              | D - 5        | 84                        | 88 | 78  | 103                        | 108 | 112 | P          | P        |
|         |           |             |                 |              | 86                        | 93 | 88  |                            |     |     |            |          |
| 9/17/10 | 11        | 51/52       | RM              | D - 3        | 80                        | 76 | 71  | 100                        | 102 | 104 | P          | P        |
|         |           |             |                 |              | 85                        | 81 | 84  |                            |     |     |            |          |
| 9/17/10 | 12        | 56/57       | MR              | D - 5        | 78                        | 69 | 71  | 99                         | 101 | 104 | P          | P        |
|         |           |             |                 |              | 79                        | 78 | 77  |                            |     |     |            |          |
| 9/17/10 | 13        | 58/60       | RM              | D - 3        | 74                        | 75 | 75  | 78                         | 79  | 80  | P          | P        |
|         |           |             |                 |              | 77                        | 78 | 76  |                            |     |     |            |          |
| 9/17/10 | 14        | R22/P27     | HM              | MX - 1       | 65                        | 70 | 73  | 73                         | 78  | 81  | P          | P        |
|         |           |             |                 |              |                           |    |     |                            |     |     |            |          |
| 9/17/10 | 15        | 33/41       | HM              | MX - 1       | 72                        | 76 | 78  | 80                         | 81  | 85  | P          | P        |
|         |           |             |                 |              |                           |    |     |                            |     |     |            |          |

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## ***Mid - America Lining Co.***

## **FIELD DESTRUCTIVE TEST LOG**

**Page:** 2 **of:** 2

Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE

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**Mid - America Lining Co.**

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               | Locations / Comments |                                   |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|----------------------|-----------------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number          | Locations / Comments              |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 1             | 10/11                | 80' DS - 2<br>(2 X 4)             |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 2             | 9/10                 | 141' - 150'<br>(2 X 9)            |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 3             | 3/10/11              | 100' "T"<br>(2 X 4)               |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 4             | 4/12                 | 138' - 172' "T" & Cap<br>(2 X 34) |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 5             | Panel 4              | 1' Penetration<br>(Boot)          |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 6             | 5/6/13/14            | 100' - 108' "T" & Cap<br>(2 X 8)  |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 7             | 5/6/13/14            | 78' "T"<br>(2 X 3)                |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 8             | 6/7/15               | 62' "T"<br>(2 X 3)                |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 9             | 7/15/16              | 48' "T"<br>(2 X 3)                |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 10            | 7/16                 | 32' Heat stress tear<br>(2 X 2)   |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 11            | 7/8/16               | 23' "T"<br>(2 X 3)                |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 12            | 8/16/17              | 23' "T"<br>(2 X 3)                |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 13            | 5/6                  | 55' DS - 3<br>(2 X 4)             |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 14            | 2/3                  | 150' DS - 1<br>(2 X 4)            |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 15            | 1/18                 | 22' - 30'<br>(2 X 8)              |

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**Mid - America Lining Co.**

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               | Locations / Comments |                                |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|----------------------|--------------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number          | Locations / Comments           |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 16            | 1/18/33              | 22' "T"<br>(2 X 3)             |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 17            | 18/24/33             | 44' "T"<br>(2 X 3)             |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 18            | 18/24/25             | 17' "T"<br>(2 X 3)             |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 19            | 18/25/26             | 40' - 47' "T" & Cap<br>(2 X 7) |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 20            | 19/26/27             | 67' "T"<br>(2 X 2)             |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 21            | 19/27                | 77' Runoff<br>(2 X 3)          |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 22            | 19/20/27/28          | 90' - 97' "T" & Cap<br>(2 X 7) |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 23            | Panel 28             | 2' Penetration<br>(Boot)       |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 24            | 20/28/29             | 125' "T"<br>(2 X 3)            |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 25            | 20/28/29             | 136' "T"<br>(2 X 3)            |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 26            | 21/29/30             | 153' "T"<br>(2 X 2)            |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 27            | 21/22/30/31          | 182' "T"<br>(2 X 3)            |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 28            | 22/31/32             | 211' "T"<br>(2 X 3)            |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 29            | 22/23/32             | 224' "T"<br>(2 X 3)            |
| 9/17/10   | HM              | MX - 10        | 9/19/10          | BL              | P              | 30            | 1/18                 | 115' DS - 4<br>(2 X 4)         |

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**Mid - America Lining Co.**

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               | Locations / Comments |                                  |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|----------------------|----------------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number          | Locations / Comments             |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 31            | 22/31                | 205' DS - 6<br>(2 X 4)           |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 32            | 24/25                | 80' DS - 5<br>(2 X 4)            |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 33            | 33/34                | 32' DS - 7<br>(2 X 4)            |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 34            | 37/38                | 44' DS - 8<br>(2 X 4)            |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 35            | 37/38/39             | 56' "T"<br>(2 X 3)               |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 36            | 40/41                | 135' DS - 9<br>(2 X 4)           |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 37            | 40/44/45             | 108' - 112' "T" & Cap<br>(2 X 4) |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 38            | 44/45/46             | 112' "T"<br>(2 X 3)              |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 39            | Panel 46             | 97' Penetration<br>(Boot)        |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 40            | 37/38/43             | 13' - 26'<br>(2 X 13)            |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 41            | 47/48                | 60' DS - 10<br>(2 X 4)           |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 42            | 48/49/50             | 116' "T"<br>(2 X 3)              |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 43            | 49/50/51             | 116' "T"<br>(2 X 3)              |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 44            | 51/52                | 145' DS - 11<br>(2 X 4)          |
| 9/20/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 45            | Panel 57             | 24' Penetration<br>(Boot)        |

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**Mid - America Lining Co.**

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               | Locations / Comments |                                       |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|----------------------|---------------------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number          | Locations / Comments                  |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 46            | 56/57                | 45' DS - 12<br>(2 X 4)                |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 47            | 31/32                | 4' Anchor Trench<br>(2 X 4)           |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 48            | R22/P27              | 4' DS - 14<br>(2 X 4)                 |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 49            | 33/41                | 135' - 157' Cap & DS - 15<br>(2 X 22) |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 50            | 34/41                | 126'<br>(2 X 3)                       |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 51            | 34/42                | 119'<br>(2 X 3)                       |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 52            | R22/P27              | 1'<br>(2 X 3)                         |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 53            | R23/P28              | Repair on skirt of boot<br>(2 X 3)    |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 54            | R31/P22              | 2'<br>(2 X 3)                         |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 55            | 3/9/10               | 140' - 150' Covered R2<br>(2 X 10)    |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 56            | R4/P3                | 1'<br>(2 X 2)                         |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 57            | R4/P12               | 25' - 32'<br>(2 X 7)                  |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 58            | R6/13/14             | 2'<br>(2 X 3)                         |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 59            | R7/6/15              | 1'<br>(2 X 3)                         |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 60            | R8/15                | 1'<br>(2 X 3)                         |

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Mid - America Lining Co.

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               | Locations / Comments |                                      |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|----------------------|--------------------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number          | Locations / Comments                 |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 61            | R10/P7               | 1'<br>( 2 X 2 )                      |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 62            | 7/8/16               | Covered R11<br>( 4 X 4 )             |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 63            | 8/16/17              | Covered R12<br>( 2 X 3 )             |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 64            | R5/P4                | Repair on skirt of boot<br>( 2 X 3 ) |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 65            | Panel 26             | 48'<br>( 2 X 2 )                     |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 66            | Panel 26             | 49'                                  |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 67            | Panel 26             | 51'<br>( 2 X 2 )                     |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 68            | Panel 27             | 55'<br>( 2 X 2 )                     |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 69            | Panel 27             | 60'<br>( 2 X 2 )                     |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 70            | Panel 27             | 66'<br>( 2 X 2 )                     |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 71            | 53/54/55             | 21' "T"<br>( 2 X 3 )                 |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 72            | 53/55/56             | 44' "T"<br>( 2 X 3 )                 |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 73            | 53/56/57             | 67' "T"<br>( 2 X 3 )                 |
| 9/19/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 74            | 53/57/59             | 83' "T"<br>( 2 X 3 )                 |
| 9/20/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 75            | 57/58/59             | 92' "T"<br>( 2 X 3 )                 |

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Q.C. Initials: E.D.R.



Mid - America Lining Co.

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               |             |                                  |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|-------------|----------------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number | Locations / Comments             |
| 9/20/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 76            | 58/59/60    | 120' "T"<br>(2 X 3)              |
| 9/20/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 77            | 58/60       | 126' DS - 13<br>(2 X 4)          |
| 9/20/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 78            | 58/60/61    | 143' "T"<br>(2 X 3)              |
| 9/20/10   | HM              | MX - 1         | 9/20/10          | BL              | P              | 79            | 47/48       | 0' - 7' Anchor Trench<br>(2 X 7) |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 80            | 37/38       | Covered R34 (DS-8)<br>(2 X 5)    |
| 9/17/10   | HM              | MX - 1         | 9/19/10          | BL              | P              | 81            | 37/38/39    | Covered R35<br>(3 X 4)           |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 82            | 3/9/62      | 156' "T"<br>(2 X 3)              |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 83            | 2/3/62      | 172 - 178' "T"<br>(2 X 6)        |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 84            | 1/2/33/62   | 1' "T"<br>(2 X 3)                |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 85            | 33/34/62/64 | 22' Extrusion Tie In<br>(3 X 3)  |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 86            | Panel 64    | 198' Penetration<br>(Boot)       |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 87            | 62/63/64    | 166' "T"<br>(2 X 2)              |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 88            | 63/64/65    | 166' "T"<br>(2 X 2)              |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 89            | Panel 68    | 137' Penetration<br>(Boot)       |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 90            | 63/65       | 96' DS - 16<br>(2 X 4)           |

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Q.C. Initials: E.D.R.



**Mid - America Lining Co.**

**REPAIR LOG**

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Project Name: 12st Landfill Project Location: Otsego Twp., MI. Material Description: 40 Mil LLDPE Tx

| Weld Data |                 |                | Vacuum Test Data |                 |                |               | Locations / Comments |                         |
|-----------|-----------------|----------------|------------------|-----------------|----------------|---------------|----------------------|-------------------------|
| Date      | Welder Initials | Machine Number | Date             | Tester Initials | Result (P / F) | Repair Number | Seam Number          | Locations / Comments    |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 91            | 66/67                | 70' DS - 17<br>(2 X 4)  |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 92            | 65/66                | 14' DS - 18<br>(2 X 4)  |
| 9/21/10   | HM              | MX - 1         | 9/21/10          | BL              | P              | 93            | 36/66                | 77' DS - 19<br>(2 X 4)  |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 94            | 68/69                | 210' - 250'<br>(7 X 40) |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 95            | 68/69/70             | 168' "T"<br>(2 X 3)     |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 96            | 69/70/71             | 162' "T"<br>(2 X 3)     |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 97            | 74/75                | 162' - 174'<br>(2 X 8)  |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 98            | 74/75                | 189'<br>(2 X 3)         |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 99            | 71/72                | 30' DS - 20<br>(2 X 4)  |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 100           | 68/70                | 20' DS - 21<br>(2 X 4)  |
| 9/23/10   | HM              | MX - 1         | 9/23/10          | BL              | P              | 101           | 74/75                | 112' DS - 22<br>(2 X 4) |
|           |                 |                |                  |                 |                |               |                      |                         |
|           |                 |                |                  |                 |                |               |                      |                         |
|           |                 |                |                  |                 |                |               |                      |                         |
|           |                 |                |                  |                 |                |               |                      |                         |

12/00 - E.D.R.

Q.C. Initials: E.D.R.